Industrial Finishing

Reg. U. S. Pat. Off.

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FROM THE EDITOR'S WINDOW

SEE what's new at the shows! This impulse or magic urge within more people every year, is responsible for crowds that flock to the automobile shows, home complete shows and various other kinds of modern industrial expositions. Something new is expected in the way of style as it is interpreted by new designs in form and decorative treatment. Progressive manufacturers recognize this condition and are "going all the way" to cultivate and gratify the desire of the masses.

The facilities of entire research laboratories are being devoted to the task of developing improvements in engineering, construction, utility and decorative effects which can be featured in some of the larger manufacturers' latest products, offered for public approval and acceptance.

Thousands of smaller manufacturers must also recognize the new conditions and make some reasonable provision for improving and restyling their products, if they expect to continue permanently and profitably in business. Really, this is one of the important factors entering into industrial management's designing, production and merchandising problems of 1929.

W. H. Rohr

Managing Editor

To produce a smooth, level, built-up surface in finishing metal articles, a "surfacer" must be used. The question arises: "Shall it be a pyroxylin or an oil surfacer?" Here is a short discussion of the practical considerations involved in industrial production.

Lacquer Surfacers and Oil Surfacers

By L. P. Nemzek, Director of Industrial Sales of E. I. du Pont de Nemours & Co., Inc., Parlin, N. J.

THE manufacturer of high-grade metal articles usually has to ask himself this question: "How can I best obliterate the holes, pits, scratches, file-marks and bumps in this metal so as to produce an article having a smooth, level, built-up surface?" The answer is that he must use a "surfacer." A surfacer is a product which has great filling power, and which when dry is of such texture that it may be readily sanded to a smooth, level surface.

The next question that he asks himself is: "Shall I use a pyroxylin surfacer or an oil surfacer?" The du Pont laboratories have made thorough investigation of this problem, and the answer is that there is no difference in the final appearance and durability between the best oil surfacer and the best pyroxylin surfacer. The pyroxylin surfacer will cost more as far as the material is concerned, but it produces a much more rapid finishing schedule. It may be sanded after three hours at room temperature, while the oil-type surfacer would require at least fifteen hours.

Since the two types of surfacers are equal in appearance and durability, an oil type surfacer should be used, for cost reasons, unless its use holds up production. Where speed is an important factor, the pyroxylin type should be used.

The du Pont Company manufactures both types of surfacer and is always prepared to assist a customer in making a decision as to which type is best suited for his conditions.

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"Am always glad to be of any help possible to this wonderful little magazine. The boys in our finishing room are continually inquiring if the new publication of INDUSTRIAL FINISHING *has arrived yet. They think, as I do, that it is a good method of keeping in touch with modern finishes and methods.—*

E. B. Smothers

RUBBING AND POLISHING LACQUER FINISHED SURFACES

Foreman Finisher of Store Kraft Mfg. Co. explains clearly and specifically just how to produce a smooth, highly-polished mirror-like finish on lacquer-finished surfaces

By E. B. Smethers

LACQUERED surfaces rubbed and polished correctly, are very pleasing, the luster obtained comparing favorably with the best of varnishes. A great deal of difficulty has been encountered in the rubbing of lacquers because of the extremely hard film and the time consumed in cutting down the orange peel effect.

There are several ways of producing a good rubbed and polished surface on a lacquered finish. Before spraying your material, be sure you have the proper working consistency, the right air pressure, gun adjustments regulated properly—and above all be clean in your work. Apply the necessary number of coats—usually three or four will do—allowing proper drying time between coats, and lightly sand the dirt nibs between each coat.

After the next to the last coat has dried overnight, watersand it thoroughly with No. 320 to No. 380 waterproof sandpaper, using water freely. There are now on the market some very good sanding liquids that can be used in place of the water. The surface being sanded absolutely level, wash it thoroughly with water and allow it to dry before going ahead with the next operation. It is advisable to use the air (compressed air for blowing off) at this time to be sure all the moisture is out of the cracks and crevices.

Last Coat Thin

Spray the last coat somewhat thinner than the preceding ones. Many lacquers cannot be rubbed successfully within 24 hours. Then, a nice polish can be obtained by using rottenstone and paraffin oil. The writer has used some very good polishing compounds now on the market, each manufacturer having labeled on the can the directions which should be followed.

Rubbing compounds, in place of the wet sandpaper, can be used on the next to the last coat with good results. They have their advantages, although the sandpaper cuts faster. They eliminate the neces-

sity of washing the slush from the work, which forms when sandpaper is used. Most compounds are rubbed until dry, acting then as a polish to a certain extent. The danger of "burning" the finish is less with the compound than with the sandpaper.

However, a very brilliant and beautiful finish can be obtained by using the proper grades of sandpaper, followed by the proper polishing methods. By using sandpaper, one cuts down and levels off the tops of the orange peel, leaving a perfectly smooth surface, while the rubbing compounds or loose abrasives, such as pumice stone, follow the curve of the orange peel or pebbled surface, cutting out as much one place as another, thereby never actually leveling off the spray pebbles.

This fact can be easily proved by looking at a highly polished surface. If the pebbles have been cut down perfectly, leaving a smooth plane, a very clear reflection will result. On the other hand, if the surface has waves in it, the reflection is not nearly so clean cut.

In using polishing compounds, I have found those containing fine abrasives, which polish the lacquer itself by the heat generated from friction, give a much more permanent polish than those having a wax base. The latter gives much quicker results, but the wax itself is polished and not the lacquer film. Washed cheesecloth makes an excellent polishing rag.

Here are a few general points to keep in mind when rubbing a lacquered surface. Use straight, even strokes—never short choppy ones. Do not bear down too heavily or use too much force, as there is danger of making heavy scratches. The abrasives will do the cutting if given just a little extra pressure. Use plenty of water or whatever lubricant is being used, with either the pumice or sandpaper.

Most manufacturers of waterproof sandpaper have a special sanding liquid which aids greatly in producing the desired mirror-like finish. It seems to have a greater affinity for lacquer than water has, lubricating and cleaning the sandpaper better than water alone.

Care of Finishers' Brushes

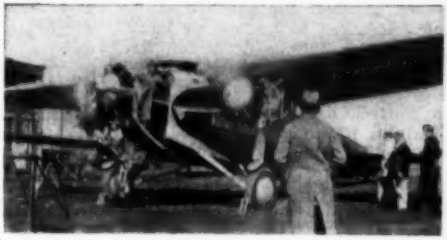
Regardless of what kind of brush is used, or what it is used for, some method must be provided for its proper cleaning and care after use.

A shellac brush should be washed several times in alcohol after being used, or it will become very hard and unfit for further use.

Varnish brushes should be washed in turpentine or gasoline, then in luke warm water and soap, and finally greased before being put away. Lacquer brushes must be washed in lacquer thinner or varnish remover, as these are the only liquids that will cut lacquer. I would recommend that paint brushes be washed with gasoline, then with soap and water and wrapped in a greased paper.

Striping brushes should be given the best of care. After use, they should be washed in turpentine and greased in vaseline or lard oil and hung up by a string or laid flat on a board, or on plate glass, so the brush will not curl. If the hair in a striping brush is allowed to become crooked, it is almost impossible for the workman to use it thereafter. Good work requires good brushes which have clean bristles and clean handles.—J. K. Cooper.

Superintendent of Covering and Finishing Dept. at General Airplanes Corporation explains in detail the sequence of operations and materials used in finishing a typical tri-motored commercial transport plane



AIRCRAFT FINISHING

By George A. Endom

SINCE PRACTICE makes perfect and perfection is the goal we all strive for, I think the best way to learn the following will be for us to completely finish a modern airplane. Suppose we have a ten-passenger tri-motor commercial transport to finish; we will then go through all the operations necessary, from the bare structure to final insignia. Where more than one method of certain details are in general practice we will follow the one most suited to production procedure, touching lightly on other methods and explaining as we go along.

I suggest that those who earnestly desire to inform themselves thoroughly make notes of the formulas and sketches which will be given, thereby possessing a reference memoranda which will be found invaluable later.

Steel Tube Fuselage

From the welding and machine shop we have delivered to us a frame some 40 to 50-ft. long, built of steel tubing and braced with diagonally crossed wires. This is the body of fuselage. Many manufacturers do not think it necessary to put any protective coating on the inside of the tubing, while others believe it of absolute importance. To protect the internal walls of the tubing we can use linseed oil, red-oxide oil-base primer, or a well known protective oil highly recommended for this purpose.

Whatever material is used must first be thinned sufficiently to seep into all joints and crevices, then put in a pressure tank and forced by air pressure into the tubes. When all tubes are filled, the fuselage is suspended over a tank and all superfluous material is drained off. This takes considerable time, the time varying according to the viscosity of the material used.

Cleaning and Priming

This is one reason why the red-oxide primer is particularly well suited for this work. It gives full protection and is easy to handle. Linseed oil must be warm to insure its flowing freely; it is cooled by coming into contact with the cold steel and then it loses its flowing properties, therefore it

Note: The picture at the top of this page shows a 12-passenger tri-motored Fokker FX, built for Western Air Express.

takes considerable time to drain off. It takes 50 gallons or more to fill the tubing of a ten-passenger fuselage and since we expect to drain the most of this off, it can readily be understood why draining time must be considered.

So even though the cost per gallon for red-oxide primer is higher than other materials, the saving of time and labor reduces the cost to little more than cheaper materials. That is why I would use the primer for coating the internal walls of all tubing.

After the frame is thoroughly drained the drain holes are plugged and the fuselage is ready for the next protective measure. Some factories lightly sandblast the structure. When this is done, primer must be put on as soon as possible, as it has been found that a sandblasted steel surface rusts very quickly. Where sandblasting is not done, the tubes must be thoroughly cleaned of all rust and scale.

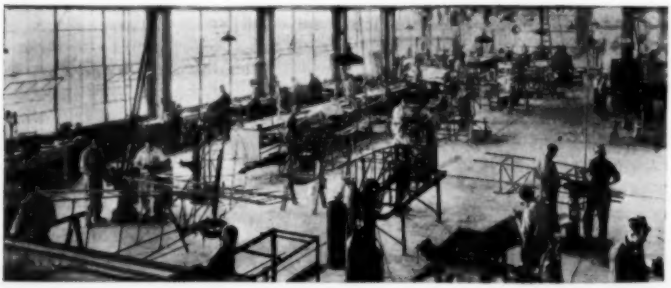
Most steel tubing will be found well oiled. Rust will not appear in any great amount, but what does appear must be removed. This can be done with steel wool, emery cloth or wire brushing—or a standard metal cleaner can be used. However, unless a shop is equipped to properly handle a cleaner of this kind it will be quicker to wash the frame with gasoline; steelwool all tubing; wirebrush welded joints, and then wash again with gasoline.

After cleaning, the first coat of primer is applied. The primers mostly in use today are aluminum varnish or enamel, and oil-base red oxide. My personal preference is one coat, brushed or sprayed, of red oxide followed by one coat aluminum lacquer. I adopted this after observing that two coats of aluminum enamel did not seem to give the protection that a rust inhibitive oxide primer afforded. So we spray a coat of oil-base primer on our fuselage, allow from 12 to 36 hours to dry, then spray one coat aluminum lacquer, which will be dry enough to handle in a short time.

Our fuselage then goes to the sub-assembly line-up for window and door frames, engine controls, instrument board and all other parts that must be in place before the frame is covered.

Finishing the Wings

Meanwhile, the wood shop has built the wings; after sanding down all corners that may cut into the fabric we are ready for varnish. We apply two coats of a good grade spar varnish. The first is thinned with about 40 per cent turpentine and brushed on.



After the first coat is dry—generally the following day—we spray another coat of clear spar varnish, this time using our material without thinning. Care must be exercised in varnishing so that all parts are thoroughly coated, especially the main beams or spars. On some special jobs a third coat is applied, this third coat having aluminum powder mixed with the varnish. The usual proportions are one pound of powder to each gallon of varnish.

Materials Used

After the varnish is dry and hard it is necessary to protect it from the coating that will be applied to the fabric cover. To do this we coat all parts of the wing that come in contact with the fabric, with one coat of dope-resisting paint. I prefer a good grade of white dope-resisting paint from a reliable manufacturer, to the other well known method of glue-sizing wood for dope-resistance. The dope-resisting paint comes ready mixed, is brushed on, dries in half an hour or so and is always uniform. To protect varnish from dope with glue-size involves considerable more trouble. First we have our mixture to make. This is:

3-ozs. of liquid wash blue.
1½-pts. (dry measure) of flake glue.

To this, add a small quantity of water and boil in a double boiler to a gelatinous consistancy, always adding enough water so that the mixture does not burn. When boiled until all glue is thoroughly dissolved, strain this mixture and add water until the amount makes one liquid gallon. A few drops of glycerine (about ½-fl. oz. to a gallon) prevents the glue from flaking.

Wash blue is used merely to show uniformity of coating, so it can readily be seen if any places are skipped. And as this mixture must always be warm when applied, one can realize that much more labor is consumed applying glue size as a dope-resistant coating than in applying dope-proof paint.

Glue size has the advantage of being lighter in weight and it costs less where a quantity is used, but there is always present the hazard of this mixture not being uniform. If too thin, the purpose of using it is defeated; if too thick it is a gummy mass that causes a lot of trouble to apply. So we use the paint, brushing it on just as it comes from the can; our wings are then ready to be covered.

Tail Assembly

The tail comprises rudder vertical stabilizer, commonly called fin, horizontal stabilizer and elevators. These parts are made of either wood or steel tubing. If of wood, we treat them in the same manner as the wings. If of metal, they are painted the same as the fuselage.

The ailerons are moveable surfaces attached to the wings. They are usually constructed of the same materials and are consequently finished in the same way.

Meanwhile the fuselage has had more parts added, which have to be painted. Window frames, door frames, walls and floors are ready for varnish, just as the wings were done.

On the sides and top and bottom, we find strips of spruce running fore and aft. There are usually two on each side and one each top and botttom. They are spaced equally between the longerons, which are the four main members of the fuselage, to give shape to the body and are commonly called fairing strips. Attachment to the cross members

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of the body is made by wrapping with twill tape ½-in. in width which is varnished with the fairing.

The method of wrapping fairings will be given later. Using strap clips made of brass is another method of fastening fairings, but properly wrapped fairings will be rigid and strong with a great saving in cost over other methods of fastening.

On the fuselage we also put dope-resisting paint wherever the fabric touches the frame. Some finishers believe that aluminum lacquer or enamel is dope resistant enough but, in the tests I have made, I find that it really is not sufficient protection. There is, however, an aluminum coating which has a varnish in its make up, the manufacturer of which claims both the protection of varnish and the resistance of dope. I have not finished testing it, but it seems to have some of these qualities.

Miscellaneous Parts

While the airplane we are working on is going through various sub-assembly details, we receive the miscellaneous small parts. The landing gear, braces or struts, control levers, etc., are all cleaned and painted thoroughly both inside and out. The instrument board is finished in a dull black. Interior control parts are finished in the final cabin colors. These parts are painted in the standard commercial way.

Where the parts are aluminum or duralumin, we first steelwool the surface to give a "tooth" to the metal. Next we wash these parts in acetic acid solution or vinegar, being careful not to handle after washing. Then the parts are primed with oil-base red-oxide primer and finished in the color specified.

Now some of the steel tube struts have a tapered piece of wood added called streamline fairing. This fairing is attached to the steel tubing by fabric tape. So these struts also get dope-proof paint.

Then, having painted and protected all the parts which get covered with fabric, and these parts having had the necessary assembly work and inspection completed, the next operation is covering. The making of the different covers, the stretching and fastening of same together with reinforcing where needed will be explained in the next article.

The natural wood finish is still one of the most beautiful, and modernistic design recognizes and emphasizes this.

Halcomb Now with Blatz Co.

Mr. D. H. Halcomb, formerly with the Finishing Products Co. of Indianapolis, as salesman and demonstrator, announces that he is now with the Blatz Co. (manufacturer of paints and varnishes) 327 So. Shelby St., Louisville, Ky.

The New "Spraco, Inc."

Announcement is made that The Spray Engineering Co., and The Spraco Painting Equipment Co., engineers and manufacturers, were merged on January 1, 1929, and will continue to do business henceforth under the name of "Spraco, Inc." New offices and factory facilities are combined at 114 Central Street, Somerville, Mass.

All the assets and liabilities of the two companies are transferred to Spraco, Inc. as of January 1, 1929.

According to the announcement, "the consolidation of these two long-established concerns brings forth a reorganized institution retaining in personnel, in tradition, in lines and in facilities, all of the strength of the individual concerns, but combining them under one management as a single unit for service, more efficient in every respect than the total of both companies as previously owned and operated." The officers are:

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Handling Work in Spray Booths

Suggesting how to move different classes of articles into and out of the spray booth, and how to support them while they are being sprayed

By Donald A. Hampson

THE variety of schemes for supporting or holding woodwork in spray booths is not particularly large, and it should be no difficult matter for any foreman to decide on the one best method for each part to be finished. Large articles must be moved in bodily, medium-sized pieces are put on stands or turntables, and small ones are hung from hooks or placed on racks for group spraying.

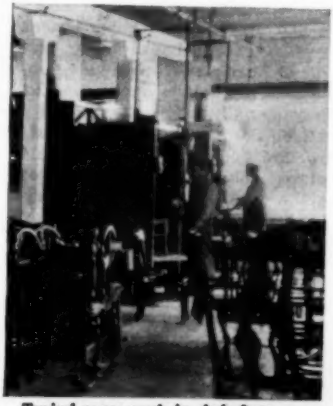
In the case of large articles, it is better to have them on dollies or trucks or skids, so that one man can move them; otherwise two men may be needed. Many concerns arrange to have the work almost entirely mobile—an adaption of automobile manufacturing methods to smaller lot production.

In the manufacture of pianos, it is customary to do a large part of the assembling on trucks on which the frame-and-legs units are placed as soon as no more "under work" is to be done. These trucks are pushed from department to department with their load and eventually the finished piano goes into the booth that way too.

A manufacturer of refrigerators puts his product on skids as soon as the frame is set up, and there it stays until it is boxed. Although it may be a large one weighing tons, it is picked up, with the skid, by a lift truck and transported where desired.

Turntable work is, of course, too familiar to require comment. A turntable affords the quickest and easiest method of getting around to all four sides of an object. Being pivoted centrally and fixed, it is much easier to swing the load that way than to move a similar load mounted on casters.

Lighter objects are either grouped or held singly. These may be small parts, units of an assembly that are to be set up later, or the miscellaneous work encountered in different lines such as bric-a-brac, novelties, and wood parts for metal products.



Typical spray work in chair factory.

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Where this work can be hung from a hook, it comes off cleaner than when resting on a table or racks. Metal hooks suspended from the top of the booth have found wide favor for this kind of work, because they are convenient and there is less "stickiness" along the bottom. Where the sides of the articles must be coated all the way down, there is always some material sprayed on the table, rack, or hook. This does not seriously affect the workmanship, but eventually it builds up a residue on the table that transfers itself to the under-sides of articles being sprayed and, as a result, these parts begin to come off quite sticky.

This stickiness is not entirely absent from hooks, although it is less apparent because of the decreased surface in contact. Hooks are wiped off frequently by all good finishers. When making hooks, it is well to know that square wire may be obtained. If the hooks are so formed of this square wire that only one square corner makes contact with what is hung up, then there will be a minimum of surface in contact with the work, and less frequent wiping off will be needed.

Polychrome Finish

Polychrome is a finish that cannot be applied to any flat surfaces; it must be applied to surfaces that have high and low spots, that is, peaks and depressions, such as statuary, book ends, mouldings, castings, etc.

The following is a brief explanation as to how polychrome finishing is done:

First apply two coats of lacquer enamel. Then let the article dry for three hours or over night if possible. High-light with the following colors: Cobalt blue, dark red, and canary yellow,* using yellow first where the light would naturally strike the article most, blue second, where there would be a shadow, and red last in the very deepest crevices of the article. The blue should cover part of the yellow, this giving a green; the red should cover part of the blue, giving a deep purple.

Different quantities of these colors give different shades. Browns may be had by applying the three colors, one on the other in the order named above. These polychrome colors, that is yellow, blue and red, should be thinned out about three to one or more with a good grade of lacquer thinner. It is also important that the colors selected be of the proper shade.

After the polychrome colors are on, a coat of the following mixture is applied to the object:

Color ground in japan	25%
Turpentine	70%
Japan drier	5%

If a high gloss is desired, add to the above mixture about 10 per cent of boiled linseed oil. When the coating of japan color starts to dry, wipe off the high lights. If a real antique effect is required, dust on a little Fuller's earth and remove the excess.
—Jos. M. Verderosa.

Fight Plague with Spray Guns

A new and unique use for Spray-Painting Equipment is revealed in an order for 30 DeVilbiss Spray Systems given by the Health Department of Rio de Janeiro. The outfits are to be used for spraying a special chemical mixture upon the walls of contaminated houses and buildings, in the fight with the Yellow fever plague.

* These color numbers furnished on request.

FINISHING SEA BOATS

Revealing some of the methods employed in sanding, finishing and rubbing the surfaces of hulls and trim of modern motor cruisers and motor yachts

By Theodore Maisch

FINISHING the hulls and trim of wooden boats is quite an exacting task. It is particularly so when the manufacturer makes seaworthy craft, small and large, that eventually may poke their noses into frigid seas or tropical waters—he knows not which.

That is the problem of The American Car and Foundry Co., of Wilmington, Del., for their craft, from the 30-foot motor cruisers to the palatial 65-foot twin-screw motor yachts, have a way of turning up in the most unaccountable and remote parts of the world.

Finishing the Hull

Treatment of the hull—or rather its finish—is most important for it may have to withstand ice one year and tropical undersea insects the next.

A 41-ft. bridge deck cruiser ready for the paint and varnish.

First, the hull is planed and sandpapered down smooth in preparation for its five coats of white lead mixed with high-grade enamel. After each coat, fine sandpaper is applied lightly to smooth the surface, and the last coat is left untouched after drying.

It is significant that no water is used on hull surfaces to raise the grain before finish is applied. Furthermore, all sanding is done by hand, primarily to obtain a level surface and to clean out the surface dirt which often falls on the work during the drying process. Artifical drying methods are taboo.

Interior Trim

While the finish of the hull is most important, yet more care and time is consumed in the finish of the interior and trim, because of the fine woods used. Teak, real mahogany, walnut and other fine woods are used for that purpose.

The same methods of finishing are used for all those fine woods. First they are scraped down with a cabinet scraper and then sanded down with a fine sandpaper by hand. Three coats are applied; in each case, marine spar varnish is used for outside trim and rubbing varnish for interior.

Light sanding, by hand with fine sandpaper, is the order between the coats. If a dull or satin finish is wanted for the last coat, the varnished surface is rubbed down with No. 0 pumice stone and

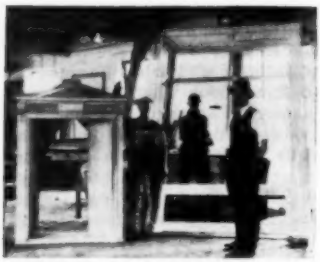
water, after which a little oil is placed on a soft rag moistened with water. After this is spread over the rubbed surface, it is wiped down with a clean cloth.

All rubbing, whether with sandpaper or the last rub with pumice and oil, is done with the grain, as this method is best for obtaining a smooth surface.

Finishing Architectural Woodwork

Factories that take contracts for the production of interior decorations run into entirely different finishing problems from those that actually manufacture a stated line such as caskets, automobile bodies, or novelties. When it comes to commercial decorations, the work is often a sort of high-grade architectural woodwork, rather than distinctly cabinet work.

In office buildings, hotels, smart shops, and the new type of luncheonette tea room, the furnishings



The articles are all custom built.

may show unusual size coupled with a perfection of detail such as is commonly associated only with the finest of furniture manufacturing. The finishing that goes along with this work must be on the same high plane.

The accompanying illustration gives an idea of a few of these "rangy" pieces as caught unannounced in a small-town factory in New York state. The articles under construction include some large frames for display cases—being finished before fitting in the plate glass—an elaborately decorated fitting to set in a paneled wall, and a frame for a window display unit of paneled form is being finished preparatory to having the rear panels inserted.

Some of this work will go in the twin booth, but other pieces, like the larger frame shown, must be finished outside the booth. This particular piece has the white undercoat on it that goes on most of their work. Other work may be stained and still more may be finished by applying several coats of lacquer.

The finishing department is located in a 40x80-ft. room in one of the mill buildings. Considerable space is needed for work of this kind, because much of it remains in storage for quite a period, during which the many operations are performed. To house a frame 7x12-ft. while it is primed, sanded, and then given several coats, is a good example of what a space eating proposition such work is. Fifty men in the wood shop can keep a foreman and five hustlers busy in the finishing room, if they are not to be swamped in a limited space.—D. A. Hampson.

Ferbert-Schorndorfer Co.'s New Sales Manager

The Ferbert-Schorndorfer Co., announces the appointment of Mr. Paul F. Kinnison as General Sales Manager. Mr. Kinnison was formerly associated with the Lanken-Vivian Co., which concern was purchased by the Ferbert-Schorndorfer Co., the early part of the present year.

Future Automobile Refinishing Business

Proprietor of an auto refinishing shop reviews present conditions in this line, calls attention to the new competition and suggests how to organize for attracting more profitable business

By Sam'l Siegel*

DURING the past three years there has been a steady decline in the business of automobile painting in shops devoted exclusively to this branch of work. This seems somewhat paradoxical, in view of the fact that the number of cars on the streets are increasing daily. What are the causes for this depression? I shall attempt to analyze these causes which I believe are responsible for a situation not hitherto mentioned or emphasized by trade journal writers.

From numerous interviews and discussions with proprietors of repainting shops devoted to vehicle painting only, the conclusion inevitably reached is that nitrocellulose lacquer finishes are responsible for this condition. The durability of lacquer, as compared to the varnish finish, and the lack of complete relacquering jobs affects their business to a degree never before experienced.

Lacquer's Influence

The remarkable lacquer finish adheres tenaciously and seldom breaks down, and then only in spots where the rays of the sun concentrate, or where the owner has "over-confined" a few energetic polishing strokes in an effort to reluster a badly traffic-filmed surface. These spots, when sprayed with the original color, blend almost perfectly with the surrounding uninjured surface, precluding the necessity of refinishing the entire body, as would be the case in a varnish-finished job.

Lower Priced Cars

Another factor detrimental to the refinishing trade, and gradually forcing itself on the attention of the refinisher as such, is the continual reduction in the prices of new cars—this rendering the private owner as well as the dealer in a mood not receptive to persuasion relative to the appearance of his old car.

The individual car owner argues that the market price of his old car does not justify the outlay required of a thorough and satisfactory refinishing job. Many dealers advance the same reasoning as the private owner, when approached on the question of refinishing old cars they have taken in, citing the market price figure of old cars to support their contention that the additional outlay to increase the resale value of those cars can seldom be realized in the final sale. Many agencies, however, do realize the importance of the impression a fine-appearing car makes on the prospect, who may be interested in a used car, and accordingly they take steps to have the car's appearance improved.

*High-Grade Automobile Painting, Vineland, N. J.

I feel it is necessary for me, at this juncture, to divert a moment for fear of being accused of skepticism as to the future of the automobile refinishing business, but I want the reader to bear in mind that this is relative only to shops devoted exclusively to automobile refinishing, of which there are a great many.

Motor Car Agencies

Motor car agencies are more and more coming to adopting paint shops of their own, operating them in conjunction with their regular repair departments. In a modern type motor car agency, I predict this refinishing department will, in time, be just as important and perhaps as indispensable as the repair department. The repaint work, even from individuals, which these automobile agencies have obtained—either by price reduction or by virtue of the advantageous position they are in through talking of refinishing to the customer whose car is in for repairs, or other work—has been seriously felt by the refinishers, and to this source the refinishing shops attribute a big portion of their loss of business. Perhaps, this is all for the best, as I intend showing eventually, since it is a factor that may spur the independent refinishers on to follow the present trend toward trade combinations, wherein his hope of survival probably lies.

In addition to the virtues above enumerated, nitrocellulose lacquer embodies a feature easily grasped by the amateur, namely, ease of application in comparison to the old style brushing method. It is mainly this feature that was the motivating force toward inducing most dealers to do their own refinishing. With the air compressor already on hand for shop use, the necessary spraying accessories are procured and, after comparatively little instruction, a man from the shop force soon becomes fairly adept in the manipulation of the spray gun; and so, in a short time, the refinishing work formerly given to the exclusive refinishing shop is performed where the car was purchased or where the owner goes for "service". However faulty the work may be, it is not nearly so noticeable to the layman as is a brushed job done by an inexperienced workman.

Some motor car dealers with an eye for business, secure the services of experienced mechanics, with the definite intention of incorporating this branch of the automotive service business with what they are regularly accustomed to furnishing. Here it may be easily seen how dealers, selling a certain make of new car, can attract customers owning that make, once this new service is made known to them. An advantage here lies in the fact that if need be, the dealer has the first opportunity to broach the subject of refinishing or touching up when the customer's car is in the repair shop for adjustment or overhauling.

Thus far I have given reasons, as I have observed them, for the continual slackening up of business going to the independent refinishing shops, the proprietors of which persist in battling the adverse current, without the foresight to perceive that the tendency toward trade combinations is probably the only solution for their problem. Now, I will endeavor to show the relation the refinishing business bears to other industries pertaining to automobile rehabitation, its importance thereto, and the reason it should be merged therein, in

Teamwork

Used singly or in combination, these two Pegex Lacquers will give maximum production and maximum selling results.

Pegex Clear Gloss Lacquer No. 78

Builds fast . . . dries fast
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Needs no sanding
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Dull (by rubbing)
Satin (overcoat of Pegex Flat)

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order to be adequately strengthened.

How Refinishing Ranks

Everyone owning an automobile is not wealthy; the majority are of the middle class. Most car owners, especially those in small towns, regard the car as a necessity rather than a luxury. To them the running condition of the car is of first importance. The various fender and body-straightening operations, radiator repairs, trimming, and other kindred work come next in order. Finish comes last in importance, once the car has been purchased and is in service.

With the private owner, this is as it should be. No owner will have his car refinished if he intends to keep it, without first having looked after the necessary mechanical repairs. Therefore, with the overwhelming majority of car owners, refinishing a car may be properly classed as a luxury, because the car's appearance does not affect its operation in any way. And the luxuries are indulged in, mostly, by those financially able to afford them.

A Combined Service

But the thoroughly equipped shop, able to handle the repairs outlined above, is in a position of the general storekeeper who suggests a new suit of clothes to a customer purchasing some small accessories considered necessary. The customer is then in a receptive mood to listen to a costlier but appealing piece of merchandise, foreign to his mind perhaps when he entered the store.

The general service shop should be able to handle wrecks, of which there are many owing to the great number of cars. This usually involves some refinishing. Trimming business also frequently involves repaint work. The trimming business has benefited greatly with the increased number of cars in service, as have also the fender straightening and radiator branches of work. Local conditions will serve as a guide, dictating to the automobile refinisher what allied business he should adopt, or which, or how many he may choose to merge with his, to combat the inroads made into his particular trade by the new competition.

There are some old-timers who have a knowledge, of one or more trades aside from the one they practice. It will not be so difficult for them to branch out; at any rate, this must be done in order to survive. The various relative branches under one roof, and preferably under one management is, I believe, the only salvation for the professional refinisher of motor cars.

Ferbert-Schorndorfer Co. Moves

The Ferbert-Schorndorfer Co., (paint, varnish, and lacquer manufacturer) of Cleveland, Ohio, announces occupancy of its new office building located on property at 12315 Elmwood Ave. The additional space will enable this concern to devote the whole of the space formerly occupied by both the office and the laboratory to a much larger and more complete laboratory equipped for both research and chemical work. The new building also enlarges the office quarters, providing much needed space.

Valentine Creates Aircraft Department

Valentine & Co., 386 Fourth ave., New York City, has inaugurated an Aeronautical Department, headed by Mr. Langdon B. Valentine, Vice President of the Company.

Mr. A. Irving Boyer, Jr., formerly with the British Royal Flying Corps will be Special Representative.

Valentine & Co., has developed several types of airplane finishing materials for wood, metal and fabric wings. The new department will specialize on complete service to manufacturers, including laboratory development and expert practical demonstration work.

"I have taken an extreme interest in reading your magazine since its first number appeared and have filed all copies, having had the occasion to re-read several of them at different times. There have been published a number of articles by practical men that have given valuable leads in understanding present production problems pertaining to industrial finishing methods."—

Philip A. Patterson

LACQUER THINNERS AND ORANGE PEEL EFFECTS

Submitting further information, recommendations and comments about the use of modern lacquer thinners, the causes of orange-peel effects and how to avoid them

By Philip A. Patterson

DURING the past few months there have appeared under "Questions and Answers" several articles* not in accordance with my experience in the formulation and application of lacquers.

First, I would recommend that for best and uniform results, any company using a lacquer made by a certain firm should also use a lacquer thinner made or recommended by the lacquer manufacturer. Any other practice is dangerous and several examples to prove such contention are in evidence.

I know of a large body company which, for a considerable period of time, divided its business among several of the large manufacturers of lacquers and thinners. No trouble of any consequence resulted until a new and more durable primer was adopted for production. Soon after this, a new mixing thinner for lacquer top coats was purchased and the trouble began.

The new thinner, which was being used successfully by at least one other large company, was found to be responsible for large areas of spotty "lifting" on over 300 jobs. This not only set the company back in its schedule, but necessitated complete refinishing of these practically completed jobs at its own expense. The policy of this body company proved costly indeed, and the management at once chose one source of supply for the finishing material. The thinner had softened the polymerized synthetic resin in the new primer.

The day of universal thinners is fast disappearing due to the new synthetic resin lacquers now on the market, and also to the keen price competition among the thinner manufacturers whereby the richness of their products is cut to a minimum. This condition exists now despite any word of so-called experts to the contrary.

Please let me make one or two observations in regard to "orange peel" effects in lacquer, as it seems to be ever present and we are like "the blind men of Hindustan who examined the elephant"—partly right at least. Orange peel

*In Oct., pages 80 to 86; Nov., page 74; Dec., pages 79 to 82.

is, to some extent, inherent to all lacquer, but it can be cut to a minimum if we recognize certain simple rules when applying it, and observe local conditions regarding "spraying viscosity," choice of thinner, air pressure, temperature, relative humidity, dry air at gun, gun and nozzle setting, and distance gun is held from the work, as well as the condition of such work.

Spraying Viscosity

"Spraying viscosity" is best determined in a simple viscosity cup, holding a definite volume at a definite temperature and allowing an aliquot portion of such volume to flow through a standard size orifice in bottom of spray cup, into a graduated cylinder. Time the flow with an accurate stop watch and always determine this resistance to flow or viscosity at the same temperature in order to obtain comparative results.

This viscosity is determined for mixtures of lacquer with the various thinners under test. Providing the prices of these various thinners are close to the same figure, this test definitely places that thinner best which gives you the lowest spraying viscosity when the same volume of thinner and lacquer have been used in each test. This is because it allows you to spray the most solids or film-forming material on your work at the least expense—and don't let the smart salesman tell you differently.

Hydrometer Readings

A hydrometer is of no value except as a means of control on materials which have been in use or are standard. New or changed materials may give vastly different results at past hydrometer readings, while any consequential change is measured by viscosity. This difference is apparent when we realize the hydrometer only indicates weight of any mass when compared to an equal mass of some standard substance—as water—and has nothing to do with rate of flow under definite pressure through either a spray gun or a viscosity cup orifice.

An example may be given where high-test gas replaces the diluent toluol in a lacquer. This results in a different hydrometer reading due to weight difference in a gallon of toluol and in a gallon of high-test gas. However, as this change is not consequential to the consumer, such a difference is often misleading and is not shown in viscosity reading if the lacquer is correctly formulated.

A Balanced Mixture

If orange peel persists, the thinner should be corrected by adding either slower evaporating hydrocarbon, alcohol, or ester, or all three in balanced proportion. One thinner may work best in winter and another better in summer, due to the fact that the *evaporation rate* or *vapor pressure* of individual solvents, even in a mixture, change in rather a narrow temperature range.

This gives a different solvent combination at corresponding stages of evaporation from the same lacquer film in winter and summer months, even though the same thinner is used in equal amount. Therefore, if one thinner is used for year around work, the temperature of the finishing room should remain fairly uniform.

It is also true that a high gum or nitrated cotton content in a lacquer is conductive to orange peel formation, and only a rich

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evenly-balanced thinner will prevent or minimize such formation in dry film. By "evenly-balanced thinner," I mean one which has its gum and nitrated-cotton solvents proportioned in such manner that the ratio of one to the other remains substantially the same from the time the film is sprayed until it finally sets up. If such a thinner is rich in active solvent to start with, a good final film should result.

Oils; Solvents

Sometimes certain oils, as blown castor oil, tend to sweat out or cause a broken appearance in lacquer films. This should be recognized as a defect in the lacquer, and not due to defective thinner, although some thinners may contain introfying substances or "holding agents" which are usually high-boiling oil solvents that tend to keep a blown or processed oil mechanically dispersed in the set-up lacquer film.

A very rapid loss of solvent or too fast a film set-up causes orange peel or reticulation. This condition is manifested by hexagonal patternwork with boundary lines of clear solids marking weak points in the film where the rapid ebullition or evaporation of solvent has taken place and has not allowed the formation of a continuous and strong film.

The solvents used in a thinner also exert an effect on orange peel other than the effect produced by evaporation rate. This is due to the *solvent power* or *activeness* of various solvents in holding gums and nitrated cotton in colloidal dispersion or solution, and such a condition is recognized in obtaining a "balanced thinner." Thus an active alcohol may, with a certain grade of nitrated cotton, give a more viscuous solution than when replaced by the same quantity of amyl acetate. This is due to the different rigidity in the gel structures produced by these solvents on the nitrated cotton; this can be seen if such films are watched and felt during the various stages they pass through in setting-up. The difference is apparent on taking a viscosity reading.

Excessive Moisture

Orange peel and blushing are sometimes both caused by the presence of too much moisture in the film. The cause is always found in lean thinner mixtures carrying an excess of water-soluble solvent, as ethyl alcohol, or an excess of rapid-evaporating constituents. Slow-evaporating water-soluble solvents, as cellosolve or ethyl lactate, contribute only to blushing when the lacquer is sprayed in or through an excessively humid atmosphere, and are safe and good solvents to use under ordinary conditions.

Silver, black and gray are beautifully conservative and are in vogue at the present time. Colors of the greatest brightness are also in good grace, especially on merchandise of advanced design and mode.

Worthington's Question and Answer Bulletin

The Worthington Pump and Machinery Corp, 2 Park Ave., New York City, has published a new bulletin on Vertical Feather-Valve compressors, which takes the form of a number of questions with illustrated and detailed answers. These interesting questions and the specific answers refer to the construction, installation, operation and maintenance of the Worthington products.

The 12-page bulletin is 8x10½-in. and is identified by the number L-620-B.

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Murphy Flexible Lacquers have the rare quality of producing a finish that cannot be told from varnish by any but the most expert—both as to finish and durability—and at the same time have the production speed of lacquer. And further than that, Murphy Flexible Lacquers have advantages over nitrocellulose base lacquer in certain steps of the production. For instance, they build far better than such lacquer, and rub with a grip like varnish, instead of sliding as lacquer does.

As to the resultant finish, there is no comparison to ordinary lacquer finish. We have never seen a higher polish even with varnish and, unlike lacquer, the finish increases in clarity as it ages, instead of fogging. You have the clarity and "feel" of varnish instead of the foggy, glass-like surface of lacquer.

As to durability, Murphy Flexible Lacquers actually toughen with age, instead of chalking and checking. They are entirely waterproof and are unaffected by humidity-checking, so much deplored in lacquer.

Murphy Flexible Lacquers have a plastic resistance to the inevitable expansion and contraction of wood, a notable failure of the rigid finish of ordinary lacquer. Many manufacturers who have learned all the facts in regard to these revolutionary finishes have readily adapted them to their finishing departments, gaining thereby a very superior finish and all that that means in increased salability of the product—and at no sacrifice of the production speed that lacquer finishing has brought about.

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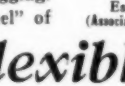

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"I am writing on Sandblasted Oak, which is a new finish that I just used on one of our store fixture jobs. The formulas, I made up myself"—

T. R. Hall.

Aged Oak Finish Sandblasted; Wire Brushed

Foreman finisher explains in detail how he stained, high-lighted, shellaced and flat-lacquered oak woodwork that had been sandblasted and wire-brushed

By T. R. Nall

SANDBLASTED finishes in wood are coming into popularity! More and more interest is created in this sort of work as sandblasted fixtures and decorative panels are placed in the finer stores, homes and public buildings.

It fell my lot recently to produce this finish. All I had in the way of information was our salesman's hazy description of what a customer wanted. After writing to several manufacturers and receiving very little help in the way of specific directions about this "new" finish, I began experimenting with sample panels. Eventually I perfected a system of treatment that gave excellent results; it produced a very beautiful finish. Later I found there was a finish in the field called "Sandblasted Oak."

Sandblasting; Wire Brushing

First the oak in the white (the bare wood), must be sandblasted. This is done in a closed room with regular equipment provided for the purpose. I used compressed air at 80-lbs. pressure. The compressed air blows the sand through a special nozzle at the end of a hose, and this, when directed toward the wood surface, roughens it, cutting away the soft parts and leaving the harder portions standing out in bold relief. Then the wood surface is treated with a motor-driven wire brush to smooth it up slightly. The finish is applied as follows:

Staining; Sanding

Water stain with English crystals*, which gives a rich, deep tone of brown that achieves the aged oak effect. Let the stain dry for 24 hours; then sand lightly all over with No. 5/0 sandpaper. Just sand enough to get a few high-lights on the edge of the wood. Then sand heavier in spots to get the "worn aged effect." Care should be taken that there is no appearance of deceit (counterfeit) here, for the surface must look as if it had actually been worn. Since the spots must be uneven, the sandpaper should be applied with a "hit and miss" movement, spotting just here and there.

*No. will be given on request.

Shellac and Lacquer

Use half orange and half white shellac—cutting in the proportion of two parts of shellac to one part of alcohol. Do not sand this shellac coat; let it set eight hours. Then spray on a coat of flat lacquer and you have a beautiful "Sandblasted Oak" finish, sometimes called "Aged Oak."

Another aged-oak finish differs in that it is wire-brushed instead of sandblasted. As a guide for this, I had a quarter-sawed oak sample from which to produce the finish. I don't know just what methods were used to secure the finish on the sample, but here is the way I matched it:

Another Method

The oak is brushed with the motor-driven wire brush which cuts away the softer portions of the oak, and leaves the pores open. The surface is then water stained with English crystals and permitted to dry 24 hours. Use the same shellac, the same drying time and the same grade of sandpaper as in the other finish just described.

Lighten up all around the flake of the oak with a hit-and-miss sanding. Leave the reddish tone on the flake, as this gives a burnished effect. One must have in mind what aged oak looks like—or have a sample—to be able to get the correct effect. Follow up with two coats of the same shellac used immediately after the sandblast treatment, allowing eight hours for drying after each coat. Sand and steel-wool, wax and polish, and then dust rottenstone into the pores very lightly to give a slightly grayish effect.

From what I learned from research men and manufacturers, there seems to be very little information on this subject at present, but the "aged" effects produced, either by sandblasting or wire brushing, are worthy of favor for any of the higher-class decorative woodwork.

Note by Editor: A short article on this subject appeared in June 1928 issue, pages 48 and 50.

The finishing foreman or superintendent who regards finish selection as an art, its development a creative work, and who is well grounded in practical knowledge—such a man has unlimited possibilities to place articles of beauty in everyone's hands.

Du Pont Announces Personnel Changes

The Du Pont Co., has announced the following changes in personnel, effective Dec. 15.

Mr. J. E. Schuyler, formerly supervisor of eastern Pennsylvania and southern New Jersey, is made special representative to focus his attention on the more important trading centers.

Mr. J. K. Spare, who has been covering Allentown and Reading, Pa., takes over the position vacated by Mr. Schuyler.

Mr. W. W. Lafferty, formerly salesman in the Wheeling district, is promoted to the supervisorship of the Pittsburgh field, replacing Mr. J. N. Werntz, whose assignment to other duties will be announced later.

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Heat Chilled Air! Avoid Orange Peel

Foreman Finisher calls attention to the chilling of heated compressed air in pipe lines and recommends the installation of a preheater to avoid orange peel effects on finished surfaces

By George Ladermann

THE FARTHER the air compressor is from the spray booths, or in other words, the greater the distance that compressed air must travel from the air storage tank to the spray booths, the colder the air will be when it reaches the spray gun and comes in contact with the material being sprayed.

When air is compressed in compressor cylinders it is heated, due to the work done on it by the pistons of the compressor. As it is discharged from the cylinders of the compressor into the air storage tank it is still very hot, but in the air storage tank the compressed air expands to a certain extent and some of the heat of compression is lost in the process of expansion. This causes a drop in the temperature of the air.

What Chills the Air

As the air leaves the storage tank it expands still more within the pipes, and practically all of the remaining heat of compression is consumed by the expansion and by the work necessary to overcome the internal resistance of the pipes.

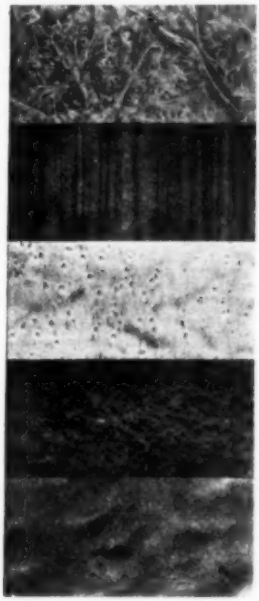
This causes a great drop in temperature which may be sufficient to cause the temperature of the air to approach the freezing point of water (32-deg. F.). The drop in temperature is dependent upon the amount of work the air must do while traveling from the air storage tank to its destination. Incidentally, the principle of making compressed air do work and thereby lowering its temperature below the freezing point is used on steamships to produce refrigeration.

Chills the Material

When the cold air comes in contact with the material being sprayed it has a chilling effect and prevents the free flowing of the material. It seems to increase the viscosity of the material and causes an orange-peel finish which is troublesome to rub to a smooth surface. The most efficient way to overcome this is to install a preheater on the material supply line. The preheater is an electric heating unit properly enclosed within an iron casing and made to fit snugly around the material supply hose. The heater heats the material before it comes in contact with the cold air and reduces the chilling effect, thus allowing the material to flow freely; this, in turn, helps to avoid orange-peel effects. Most manufacturers of spray equipment have such heaters in stock and will install them properly at a small cost.

The Preheater

Essential points to remember when buying such a heater are that the heater must be entirely fireproof, with all heat-carrying



MADRONE BURL
A western United States Maple, used for overlays, inlays, decorative purposes.

AFRICAN WALNUT
An old world member of the Walnut family used as a principal wood in furniture building.

BIRDSEYE MAPLE
a freak growth of the native Maple sought for overlays and other decorative uses.

LAUREL BURL
belongs to the Maple family and is found in the western part of the U. S. A decorative wood used principally for overlays.

BLISTER POPLAR
obtained from freak growths found in the native Poplar. Used for overlays and other decorative purposes.

Panel by Pearl City Veneer Co.

If yours is an unusual finishing problem —or if you wish to secure some special finishing effect— or if your requirements are the everyday needs of the finishing room —you will like our prompt, intelligent service.

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VARNISHES—LACQUERS—ENAMELS

JAMESTOWN WOOD FINISHING COMPANY

MAIN OFFICE AND FACTORY
Jamestown - - New York

BRANCHES
Milwaukee, Wis. New York City Bristol, Conn. Lenoir, N. C.

parts protected from outside contact. The heater unit within the casing should be packed in sand or other fire-resistant material to prevent arcing between the turns, in case they should ever come in contact with one another by accident. A heater properly constructed and installed is safe and will help to produce better finishes.

If no heater can be installed and if cup guns are used to spray the material, a one-gallon can containing the material in use may be set in a pail half full of hot water, which will supply the necessary heat.

Coloring Exterior Metalwork

For years we have practiced the coloring or tinting of interior metal work. Grills, lamp bases, chandeliers and wrought iron work have been tinted and colored to the enhancement of all interior beauty. Now, methods have been found whereby exterior metal work may be given a permanent and delightful color.

At a very fine fountain, for example, the heavy rod fence has been colored a deep, rich greenish tint, that it might more perfectly harmonize with the colossal seahorses, rush screens and other metal work. To effect the desired color, the fence was built of copperweld rod, which is a steel-cored metal having a heavy layer of pure copper molten welded to it in the original ingot.

In applying the deep, rich green color to the fountain fence, the following formula was used.

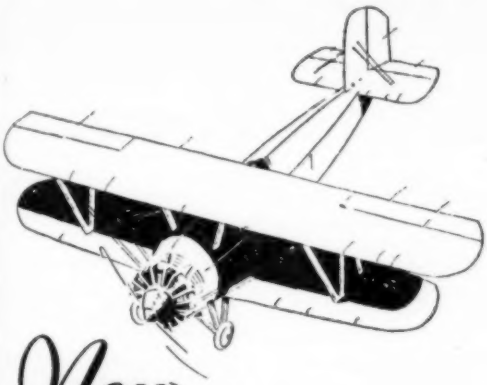
Water	3 qts.
Muriatic acid	1 qt.
Verdigris	3 lbs.
Copper Carbonate	1 lb.
Powdered arsenic	½ lb.
Powdered sal ammoniac	3 lbs.

This solution was applied by means of a brush, each application being allowed to dry two or three days before the successive application was made. Applications were continued until the desired tint was reached. This method has made the rich, greenish tint a definite part of the copper, it being unlike ordinary verdigris in that it has no tendency to flake or scale.

Copper, when exposed to the elements, after a time will develop a sea green, due to the natural chemical phenomena between the atmosphere and the metal. Especially is this true along the sea coast where the atmosphere is salt-laden. Tints of this kind, which are both striking and permanent and which artists are wont to call "patina," may quickly be developed on copper exterior wire or rod, either with the above solution or any one of several others.

The most simple solution perhaps, and one which gives equally satisfactory results, is merely the addition of ½-lb. of salt to every two gallons of water. This saline solution can be applied with a brush, then allowed to dry thoroughly. Successive applications are made at intervals of one or two days until the desired effect is produced. Still another very good solution is made by dissolving one gallon of sal ammoniac in about five gallons of water. This solution should be allowed to stand at least 24 hours after mixture, then applied with a brush covering the copper thoroughly. After one day, sprinkle the surface of the metal with clean water and allow to dry.

Another very successful method of securing a desired tone is to apply a solution of 1 gallon of water (heated to about 150-deg. F.) in which has been dissolved



New . . . an Airplane-tested Finishing Lacquer

Berryloid 507 Clear is the sensational new finishing lacquer that even extreme heat or rapid temperature changes can not damage. Tested on airplanes this remarkable material withstood the terrific speed, sun, rain and snow without the slightest harm to the tough film. Berryloid 507 Clear is recommended for outside or inside use and is equally effective on wood, fabric or metal. Applied over lacquer or enamel it brings out a high gloss and permanently protects the undercoats. You will want to know more about Berryloid 507 Clear. Write or wire for complete information and samples.

Fine Industrial Finishes

BERRY BROTHERS
Varnishes Enamels and Lacquers
Detroit, Michigan *Walkerville, Ont.*

Branches in Principal Cities

¼-oz. of sulphuret of potassium and ten drops of ammonia water. Successive applications of this solution will develop tints in the following order: brownish, reddish brown, bluish-black and black. It is merely necessary to remove the excess solution when the desired tone has been reached; then wash thoroughly with clean water.

Brown, reddish brown, or blue-black tones may be obtained on copper surfaces merely by rubbing the copper-covered steel wire with cotton waste that has been soaked in boiled linseed oil. This application, when continued, will gradually turn the copper to a rich, dark brown, the color tint adhering to the copper surface for a very long time.

Naturally, the original copper surface must be thoroughly cleansed before applying any solution. This is usually accomplished by washing the copper with a weak lye solution, then rinsing first with clean hot water, then clean, cold water.—Copperweld Steel Co.

For Over 40 Years

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LACQUER

A Paint Varnish Lacquer For Brush Dip or Spray

The Three combined in One

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From which all shades may be made

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Works: Newark, N. J.
Established 1857

Gilsonite, Black Mineral

Gilsonite, one of the world's oddest minerals, is mined only in Utah, according to the U. S. Bureau of Mines, Department of Commerce. It is a brilliant black asphaltic substance, and is used in the manufacture of varnish, paint, electrical insulation, inks, telephone mouthpieces, electric switch handles, and knobs and buttons of various kinds.

The material is a member of the asphalt group and, as it was discovered on the Uintah Indian Reservation, it was first called "Uintaite."

Samuel H. Gilson became interested in these deposits and spent many years in his efforts to find a market for Uintaite. His enthusiasm was regarded as more or less wasted by the people of the vicinity and the term "gilsonite" was applied to Uintaite. When Gilson's efforts finally developed a market, the name "gilsonite" had become firmly attached to this substance and it is now so known throughout the world.

The first safety precaution to be taken in many of the older plants should be in the way of provisions made toward larger windows and better ventilation. This will increase the safety factor and, what is almost as important, make the plant more "liveable."

A Bradley-Hurtz Finish

THE growing importance of color finishing has led many manufacturers to spend a great deal of time and money on experimental work.

We have made it our business to be equipped with studios, scientific research and experimental departments that will save you this unnecessary expenditure.

A Bradley-Hurtz Finish can be created that will eliminate worry and trouble for you, and present a new and exceptional appearance to your products.

Your inquiry will be handled promptly and confidentially.

BRADLEY-HURTZ Co.

2626 S. Dearborn St. Chicago, Illinois

ENAMELS LACQUERS INDUSTRIAL PAINTS & VARNISHES

Finishing Pencils and Penholders

Pertaining to the finishing of wooden pencils and penholders, using tumbled clear fillers and dipped color lacquer enamels to produce a durable and beautiful finish

By C. F. Merrifield

IN SOME CASES where pencils or penholders are made from certain types of red cedar there is sufficient cedar oil in the wood to slow up the drying of the lacquer coats. Some manufacturers of hexagonal pencils also use paraffin or similar greasy materials in their shaping machines to increase the accuracy and smoothness of the hexagonal sides. This impregnates the wood and interferes with the adhesive and drying properties of the lacquer. In either case it is advisable to dip the pencils in a bath of lacquer reducer to remove these oily substances before the lacquer is applied.

Some manufacturers of pencils and penholders have experienced trouble in the use of shellac as a finishing material, due to the grain of the wood being raised. This, no doubt, is due primarily to the presence of small quantities of water in the alcohol used in cutting the shellac.

Lacquers, which are made especially for finishing pencils and penholders contain no moisture, and consequently raise the grain of the wood much less than alcohol-shellac mixtures. Where an extra good finish is desired, however, it is desirable, even when lacquers are used, to use a clear filler to fill the pores of the wood and bind down the fuzz and fiber before the lacquer is applied.

Filling by Tumbling

Clear fillers, made especially for this purpose, are now available; these can be applied to pencils, penholders, wooden handles and similar objects, by placing a number of the objects to be coated in a tumbling barrel and then adding a small quantity of the filler.

As the tumbling barrel revolves, the pencils roll around against each other and the filler is spread out in a very thin, uniform coat over all the pencils. This tumbling operation should be continued until the pencils are all coated; then they should be dumped onto a screen and allowed to dry overnight, when they will be ready for coating with lacquer.

Care must be taken to avoid using too much filler for the number of pencils in the tumbling barrel; otherwise there will be an excess of filler on some of the pencils, which may cause them to stick together and leave rough surface defects when they are broken apart after they are dry.

If only enough filler is used to cover the pencils, it will be found that the pencils are practically dry when taken out of the tumbling barrel and there will be no tendency for them to stick together. Some concerns use a coat of clear lacquer, applied by the dipping process, as a primer

BEST NEXT TO WOOD

Du-Pros Shellac

Made better by the double process

The extra operation in making explains the extra quality. Du-Pros is strictly pure, of course. It contains only high grade shellac gum and Government test alcohol, but these ingredients are put together in a way that produces a superior shellac. Du-Pros spreads smoother and farther. It sands easier. Du-Pros is best next to wood.

JAMES B. DAY & CO.
1872 Clybourn Ave.
CHICAGO

Manufacturers of
WOOD FINISHING MATERIALS

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and sealer of the wood to replace the clear filler coat described above.

Lacquer Finish

If colored lacquer enamels are used, they should be stirred thoroughly before removal from the shipping container, to insure uniformity of body and color. They should be reduced as little as possible with the reducer recommended by the lacquer manufacturer and still produce a smooth, uniform flow, free from sags, runs or other defects. The proportion of reduction will vary according to the lacquer used, the size and design of the pencil or penholder, the temperature of the room and the method of application. In general, the lacquer can be used heavier with a slow immersion dipping machine than by the hand-dip method.

These dipping lacquers give a beautiful finish that is both hard and durable—one that will raise the grain of the wood less than an alcohol-shellac mixture, and will withstand the stamping of names on the pencil or penholder afterward. The dried film is also tough, water resistant and does not mar easily.

Reducing Spray Booth Fire Hazard

A suitable exhausting system, by which all fumes and dust are removed from the room, insures better working conditions, making it more pleasant, more healthful and much safer for workmen —thereby resulting in bigger and better production. The fire hazard is also greatly minimized.

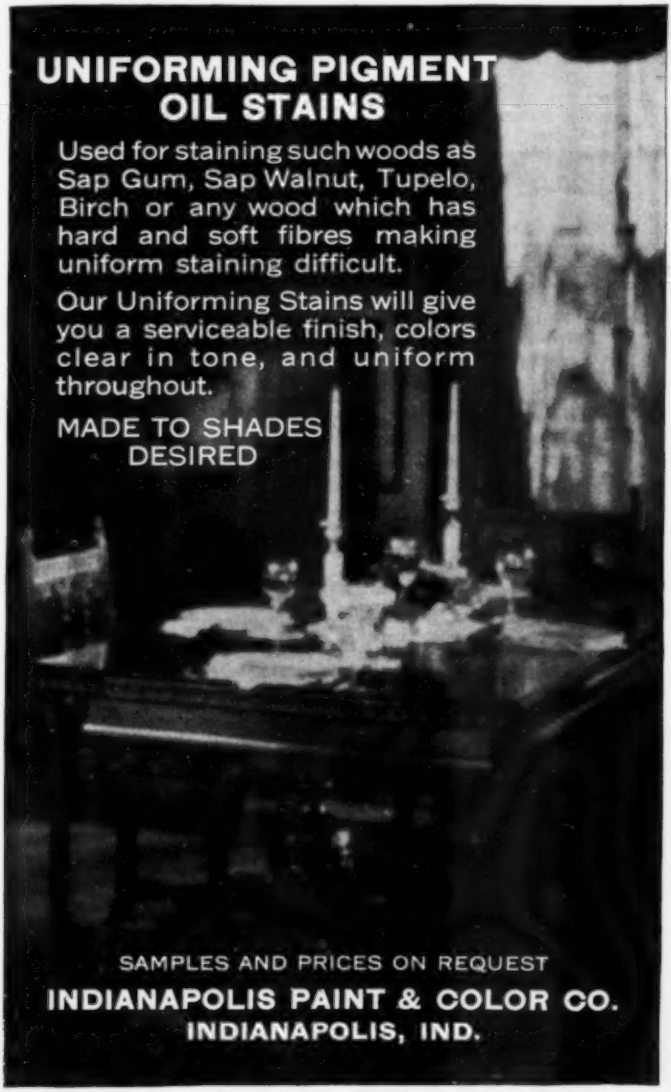
Spray booths should be made entirely of metal; the surfaces should be as smooth as possible, as this makes the booths neater in appearance and much easier to keep clean. One of the simplest ways to keep a booth clean is to make a wood frame that fits just inside the walls, and cover this with heavy paper. The paper can be easily removed and replaced as often as is necessary. Another method is to apply a thin coat of grease or hard oil over the walls, making it easy to clean off when necessary.

Place the fan or fans—which vary in size and number in proportion to the size of the booth—in such a position as to obtain equal velocity of air at all points in the booth, thereby insuring complete removal of the fumes.

The floor of the booth should be of sheet zinc so that trucks or any kind of metal striking against metal will not cause sparks. Sprinkler heads should be installed in the front top of the booth, with metal screens as reflectors arranged to throw sheets of water directly on the flame. This will protect the room outside, confining the fire to the booth itself.

Lighting should be done with vapor-proof reflectors attached to the front of the booth. They should be arranged so as to be focused at any point in the booth when so needed.—E. B. Smethers.

Trademarks have an immense advertising value. It is the finishing department's job to apply the mark that becomes part of the fin ish; it can be made an asset or a cheap billboard advertising scheme, depending upon the thought and care devoted to the selection of a design and the process of its applicaton.


UNIFORMING PIGMENT OIL STAINS
Used for staining such woods as Sap Gum, Sap Walnut, Tupelo, Birch or any wood which has hard and soft fibres making uniform staining difficult.
Our Uniforming Stains will give you a serviceable finish, colors clear in tone, and uniform throughout.
MADE TO SHADES DESIRED
SAMPLES AND PRICES ON REQUEST
INDIANAPOLIS PAINT & COLOR CO.
INDIANAPOLIS, IND.

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"This article is sent subject to your approval and correction. In this connection I wish to state I am not interested in any manufacturer's product, only as to its performance, merits and results.

"If any one should be interested to the point of requiring further information, I will be glad to furnish same upon them writing you, Mr. Rohr, or me direct."—

Edward C H Rottmann

A BLEACHING LACQUER

Foreman Finisher in fixture factory tells some of his experience in finishing woods in light natural colors and declares in favor of a clear lusterless lacquer for this purpose

By Edw. C. H. Rottmann

SO MANY very profitable articles have appeared in INDUSTRIAL FINISHING magazine from time to time on the bleaching of wood and similar topics that I feel sure the following is of interest also.

I have in mind a clear lacquer which is another helpful thing that can be used to advantage in the lighter or bleached tints or tones of color in wood finishing. It can be brushed or sprayed, and does not show any brush marks or laps when dry. It does not deepen or change the color of the stain coats. The peculiarity of this lacquer is that it does not affect the stain color as some other finishing coats do.

To illustrate this fact, I cite the fumed stains where this is very pronounced in that often shellac, varnish, or lacquer throws the color from a soft greenish brown to a reddish cast, whereas a coat of this lacquer, applied first, will cause the stain to retain it's natural color, after which it can be finished over as desired.

For Light Walnut

In finishing walnut in a light color, it is my contention—and where the experiences of my own tests can be taken as a standard of judgment—that this material applied directly to the wood as a size coat before filling, will work faster and more satisfactory (where a lighter finish, to a degree, is desired) than bleaching compounds, in that it does not raise the grain of the wood nor does it require any sanding before filling.

Comparing two walnut panels of the same veneer stock one coated with the lacquer, the other left without any finish just as it comes from the cabinet shop—these two panels when placed side by side, it would be difficult to distinguish which one was coated.

This lusterless lacquer leaves the surface of the walnut wood in its natural color state, in that it has the appearance of the bare wood.

Another Finisher's Experience

Just to show how this material can be used to advantage. I will cite an experience I had recently when a finisher came to me with a problem of finishing walnut in a light shade. The walnut wood on this particular job of window dis-

What Every Lacquer User Knows

It isn't the cost per gallon that counts, it's the cost per square foot of finished surface

THE finishing foreman wisely insists on lacquer containing ample quantities of Butanol.* His experience has proven that Butanol* guarantees not only ease of application under varying atmospheric conditions but also a finished surface requiring minimum sanding and polishing; all coats are completely united and, wherever necessary, touching up can be accomplished without difficulty.

Butanol* in lacquer thus gives speed and simplicity to the finishing operations—it reduces labor and overhead charges, guaranteeing lowest cost per square foot of finished surface, and—*lacquer containing Butanol* costs no more per gallon.*

*and its derivatives

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play fixtures was darker to begin with, than the sample submitted to him by his customer.

He could not use bleaching compounds with marked success, because he had to avoid the cost of the bleaching operations owing to the amount of scroll work included in the design—and the cost of labor to be involved was limited. It had to be done at a price. He took a small quantity of the lacquer to try. He was astonished at the results obtained; he finished his work satisfactorily with this material and also kept within his cost limit.

I have finished jobs from time to time with this material and, for securing uniformity of a light color on this wood and where ordinary care has been exercised in the selection of the wood and veneers, the results are gratifying. To me it has proved advantageous in every respect.

Smoothing and Rubbing Finish Jobs

Allow the first coat to dry thoroughly and scuff off all dirt, nibs, etc., with fine sandpaper. After this coat, it is not necessary to sandpaper between coats. The writer has found it a big help, on high-class work, to wet sand the next to the last coat with grade No. 240 wet-or-dry sandpaper. The final coat can be rubbed with either oil, or water and pumice. For a heavy coat, the water rub has proved the best, but for veneered work and one or two-coat jobs, rubbing with oil is advisable.

A good surface can be obtained with just a waterproof sandpaper. It is advisable to add a little pumice to the water or, better yet, sprinkle a little on the work before rubbing. This aids in keeping the sandpaper from filling up. A very passable job can be obtained by using a fine grade of steel wool dipped in rubbing oil. This is of special value in a one or two-coat job.—E. B. Smethers.

A siren starts and stops the men at the beginning and the close of their working periods. This system of informing workmen when to start and stop work holds a note of authority in its alarming screech, and it saves some men from worrying about whether or not it is time to stop work.

Sanders Joins Standard Varnish Works

Announcement is made that Mr. William A. Sanders, formerly with the Eagle-Picher Lead Co., has joined the organization of the Standard Varnish Works, Jan. 1. He will be director of the company's grinding sales department, and will also be active in the company's industrial sales department.

DuPont New England Sales Manager

The Du Pont Co., announces the appointment of Mr. W. T. Banning as district sales manager in New England for the Paint, Varnish and Lead Division, succeeding the late Mr. Benjamin H. Ring. Mr. Banning has been with the Du Pont Co., for 15 years and during the past 8 years he has been assistant sales manager in the Philadelphia district.

In Airfinishing Division of American Industrial Supply Co.

The American Industrial Supply Co., manufacturers and distributors of finishing equipment, 264 East 98.h St., Brooklyn, N. Y., announces that Mr. H. Abramson is now in charge of their Airfinishing division. He was formerly connected with the Paasche Airbrush Co., in the New York office. The American Industrial Supply Co. distributes Paasche equipment.

The desire for color and design came into man's consciousness long before the wish to preserve his buildings.

QUESTIONS AND ANSWERS

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Finishing Golf Tees

I make golf tees, and would like to color same light red; also light yellow, and finish them with a hard oil finish or a hard wax finish. I use tumbling barrels.—John Duncan.

One way to color and finish your golf tees would be to dip them in red or yellow oil stain; after they have dried a few hours they can be thrown into one of your tumbling barrels with scraps of newspapers and a few pieces of wax to polish them.

Another system of finishing golf tees, which is now being used, is one which makes use of colored lacquer and a centrifugal or twirling type of washing machine* now on the market. The tees are loaded into the revolving tub of this washing machine and the tub and tees are then lowered into the lacquer which is in a larger tub surrounding the one in which the tees are placed.

The inner tub has many holes or perforations in it and the lacquer runs in and covers the golf tees; after setting in the lacquer for a minute or so the inner tub is raised above the level of the lacquer and, after most of the excess lacquer has drained off, the tub is revolved rapidly to dry the lacquer.

During this whirling period the tub is stopped temporarily once or twice and the tees broken apart. The whirling is continued until the tees rattle freely in the tub. This gives a waterproof, colorful finish. Oil stain, lacquer, etc. mentioned above can be obtained through paint, varnish and lacquer manufacturers who advertise in INDUSTRIAL FINISHING.—Chas. Blanford.

*The "Laundryette"

Finishing Sap-Streaked Walnut

What method do you consider the best for finishing solid walnut where production is wanted? As you know, most solid walnut we get today is full of sap streaks and very hard to match up to a uniform color. While we get the required results we seem to have to do an unnecessarily large amount of work to secure them and and would like to know if you have any suggestions about finishing solid walnut, taking into consideration costs of production, quality of finish, and uniformity of color and finish.—F. LaS.

For the easiest and best method to finish solid walnut, where quantity production and quality are desired, I offer the following schedule:

Fill and stain with wood preparation. This is a combination which has a pyroxylin base; it stains, fills and seals in one operation and is permanent to light and should not be confused with the

so-called combination fillers. This preparation has good penetration, and gives a uniform color to the surface.

Should any sap streaks show up, I would suggest they be shaded in with a lacquer stain of the desired color. This stain can be immediately applied over the filler without the slightest bleeding. After a period of two hours the first coat of lacquer can be applied, followed in a short time with another coat of lacquer; this should give an A-1 job. If a rubbed finish is desired, the rubbing should be done the following day—it can be readily seen that by this method a complete finish has been accomplished in one day. Note that sanding has been entirely eliminated, which in itself is a great saving in time and cost. This system is being used with complete satisfaction.—Philip Myers.

Cleaning and Refinishing Galvanized Iron Containers

We have cause to repaint large numbers of galvanized iron containers. The method we are now using is to strip the old paint by dipping the container in boiling caustic soda, followed by a washing in pure water to remove all traces of the soda and grime, then buffing the surfaces with a wire brush.

For paint, we usually use a bond coat which is baked for 2 to 2½ hours at 170 to 200-deg. F., followed by a second coat which may or may not be baked according to the color, and finally pyroxylin lacquer.

We find, from experience, however, that particularly about the edges and seams of the containers, the lacquer chips readily. We desire to obtain, if possible, an air-drying lacquer and bond to take the place of the baked coating we are now using. We wish your comments on the above problem, with particular reference to the preparation of the container for painting.—M.O.W. Co.

The system you describe for removing the old paint from galvanized-iron containers and making the surface ready for painting, seems to be a very good one—provided sufficient care is taken to remove the caustic soda from the seams. The trouble you have been experiencing around the seams and edges of these containers would indicate that possibly all traces of the caustic soda are not removed.

My suggestion for improving your present system of cleaning is to rinse the containers in a very weak acetic acid solution (not stronger than two or three percent) after the containers have been removed from the caustic soda solution and wash in pure water.

The containers should be rinsed again in pure water after the acid dip to remove traces of the acid. This acid wash will do two things: it will neutralize any caustic soda remaining in the seams, and it will slightly etch the surface of the metal so as to give a firmer tooth to the first coat of finishing material.

The wire brushing operation which you use is a very good one and we would suggest that you use this after rinsing the caustic soda solution off the containers. In other words, our suggestion would be that you follow the same procedure as you now follow, but add two additional operations—a rinse in a very weak acid solution and a rinse in pure hot water.

Just Cold Turkey

BARRETT'S

Pure Shellac Varnish Has Proven a Boon to Furniture Manufacturers

No legerdemain methods are employed in its manufacture—it is a simple combination of pure gum shellac and No. 1 special denatured 190 proof alcohol. *Nothing else.* Every gallon is absolutely guaranteed to be full weight, light in color, quick drying and free from dirt.

If your product requires shellac varnish and you want the very best to be had, it will be to your advantage to write us.

◆◆◆◆◆◆

BARRETT VARNISH CO.

Originators of Dependable Finishes

2242 BELMONT AVE. CHICAGO, ILL.

Of course, it is very necessary that you allow all traces of moisture to evaporate from the seams before you apply the first coat of finishing material. It may be that the cause of your trouble has been in the type of finishing material you have been using, but generally speaking I believe that a baked bond coat has a better chance of adhesion than an air-dried bond coat under lacquer. One or two of the larger varnish manufacturers have an air-drying bond coat which, when properly applied, gives very good adhesion but even this air-drying bond coat adheres better when it receives a slight bake.—R. L. Masterson.

Putting on Red Dots with Lacquer

We have a problem which we are wondering if you can help us solve. We are placing a red dot about ½-in. in diameter, on a piece which we are making, with a red quick-drying lacquer. We are doing the work by hand. We are wondering if there is a spraying device which would enable us to do this work more rapidly?

It is necessary that the spot be put on without affecting the finish on the article itself, so it cannot run out over the piece nor can it permit the spray to spatter the piece. The flow must be slow enough so it will not run, and yet fast enough so it will cover completely. We do not have compressed air.—T.M.Co.

Not knowing exactly the conditions surrounding the finishing of your products, of course, we cannot give a very definite answer as to the best way to put the red dot on your work. We have in mind two ways of doing it. One way would be to make a stencil of brass or other rigid metal; place this tightly against the work and spray the red dot through the opening in the stencil.

Another way would be to make a silk screen and put the red dot on the work by the silk-screen process which, as you no doubt know, makes use of a paste paint forced through the silk screen by a rubber squeegee. Since you do not have compressed air, possibly the silk-screen process would be the best for you to use, but if you contemplate installing compressed air, then the spraying process would also be very satisfactory.—I. F.

Your problem of placing a ½-in. in diameter red-spot on your work in question might be successfully done with a very small spray, of which there are many makes. But why not use a decalcomania which, I believe, would give you just as good results on the finished product, and surely it would reduce the cost of the operation as well as give you the advantage of increased production.

Decalcomania may be made up in any desired design to meet your requirements. With the spray or by hand-brush work on this operation, there are many pieces which would have to be done over the the second time. The decalcomania will eliminate most all of this waste.

There is very little work involved in using decalcomanias. Simply allow the decalcomania to become thoroughly moist by laying it in water or on a cloth dampened with water. When the transfer is loose, it is slipped from the backing onto the work and rolled out perfectly flat and allowed to dry. Then you may finish over it with several coats

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SATIN FINISH DRAWER COATERS

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Requires No Sanding
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Standard Shades

Clear	Toona Mahogany
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Golden Oak	Spanish Walnut

Or We Can Match Any Shade You Desire

Send for a Working Sample. Use Coupon Below, and Specify Shade Wanted. Or Send Sample or Panel Finished in Color Desired,—and We Will Match It.

The GILBERT SPRUANCE Co.

Richmond and Tioga Streets Philadelphia, Pa.

The GILBERT SPRUANCE Co.
Philadelphia, Pa.

Yes! Send us a Free working sample of SPRUANCE QUALITY SATIN FINISH DRAWER COATER and we will try it on our work; color———

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Address.----------

"A FINISH FOR EVERY PURPOSE"

Stille's Lacquer Shading STAIN

The salability of your product demands an attractive appearance.

Complete harmony of color tone makes a lasting impression upon everyone handling your product, from the dealer to the ultimate user.

Stille's Lacquer Shading Stain makes possible the desired color tone by furnishing the shaded and high lighted effects, which go so far in making the final appearance of your product a real one.

Stille's Lacquer Shading Stain dries instantly, will not bleed through any type of succeeding coat, and acts as a uniformer when different woods are used in combination, as well as for variations in the same run of wood.

Some of the largest radio and furniture manufacturing houses in the middle west are using large quantities of our Lacquer Shading Stain, and find it to be a real sales builder.

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of lacquer, or varnished and rubbed. Or, if you are using enamel, the decalcomania will be placed upon the last coat, rolled flat, allowed to dry thoroughly and sent out in this manner.—F. W. Purdon.

Bleaching Mahogany and Maple Overlays

We have an overlay of mahogany on walnut and also on birdseye maple. Is there a quick way of bleaching the mahogany to a uniform color? Some of this is light and some is dark, but we prefer to have it all rather light in color. We can bleach it but our method involves more than one operation; we thought you might know of a way to bleach this wood uniform in only one operation.—L. V. F. Co.

A good bleach can be secured by using peroxide or sal soda. Bleaching depends a great deal on the texture of the wood; it may be necessary to dilute the peroxide with water, but after a little experimenting the correct strength of the bleach can be found. In some cases the sal soda is mixed with the peroxide.—Philip Myers

Lacquering Oak in Clear and Enamel

Will you kindly supply me with information as to the best way of finishing oak in lacquer, clear and enamel in two coats? I have experienced some trouble in doing this in two coats, the last coat showing the pore impression. I can eliminate same by rubbing and polishing, but this is too costly on large articles of approximately 6x8-ft.

My method on clear has been: first, combination filler and stain

(nitropaste); second, sanding sealer; third, clear lacquer.

On white enamel on oak: first, natural paste filler (nitro); second, flat white; third, ½ flat white and ½ gloss white; fourth, gloss white, sanding between coats. I have no trouble whatever on better grade work when using more material and taking more time doing same—J.T.W.

It is practically impossible to finish oak in clear lacquer and lacquer enamel in two coats, so as not to show any trace of the pores in the oak. About the best you can do with two coats would be to fill the pores of the oak as thoroughly as you can with natural paste wood filler of the oil type rather than the nitro-cellulose type, as the oil-type filler will shrink less in the pores than the nitro-cellulose filler. Over this you can apply a coat of lacquer sealer, or a rather heavy coat of shellac. This coat should be sanded very thoroughly and then a heavy coat of clear lacquer applied. Even with all the precaution you can take I believe that some of the pore impressions will still be visible.

For a lacquer enamel finish, the system you have of using paste wood filler, a coat of flat white lacquer, a coat of half flat and half gloss white lacquer, and a coat of gloss white lacquer, sanded between coats, is about as good as you can do with this number of coats. My only suggestion would be that possibly you can get better filling properties with an oil-type filler, rather than a nitrocellulose filler.—F. C. Overhauser.

Your question of how to finish oak with a two-coat lacquer job,

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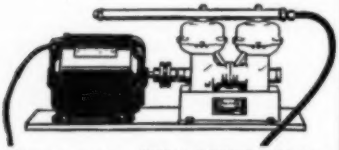

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and not have the impressions of the pores of the wood show on the finished work, has only one successful method and that is hand rubbing—owing to the fact that lacquer has not the body or "build" which varnish or enamel has. Lacquer also knits very closely to the wood, therefore showing these pore impressions.

You may be helped some by refilling your work and finishing it with a flat lacquer. Oak pores are very deep and wide and, as all fillers have a little shrinkage, after drying a slight impression of the pore is left. It is difficult to coat with a thin material such as lacquer, without having these pores show on the finished work.

As stated before, rubbing the surface after coating is the only successful answer but this, as you say, is expensive. Flat lacquer will give you this rubbing effect and the pores will be less conspicious. There is much work finished with flat lacquer and the pores are seen only under close examination.—F. W. Purdon.

Finishing Decal'd Wooden Cubes

We have recently developed a new novelty which has a 3-in. wooden cube with all six faces to finish natural. The cube has a small decalcomania transfer on four of its faces. We would like some information on a suitable finishing material and a process of handling this article on a quantity production basis.—S. Mfg. Co.

Without knowing the use to which the wooden cubes are to be put and the results expected of the finish, it is rather difficult to give any definite suggestions for finishing. If you have plenty of space for drying, possibly the low-

est priced system of finishing would be to dip the cubes in an oil stain of the proper shade; let this dry over night and apply one or two coats of varnish by spraying.

If you need greater speed in drying than varnish would give, then you can use clear lacquer to replace the varnish. Where lacquer is used, however, it will be advisable for you to use a water stain in place of oil stain, as many oil stains do not work well under lacquer. Of course, where a water stain is used, the grain of the wood will be raised to some extent and it will be necessary for you to apply a coat of shellac, a coat of lacquer sealer, or a coat of substitute shellac; after this coat is dry for a few hours, sand off the raised fuzz of the wood; following this, two or more coats of lacquer can be applied by spraying, each coat being allowed to dry an hour or so before the next one is applied.

I assume that you have developed a suitable method for holding these cubes while they are being coated by spraying, but in case you have not, I suggest the advisability of trying a holder with needle points which would be inserted in diagonally-opposite corners of the cube, so the cube could be turned freely while being coated.

If some system similar to this is not feasible, then it will be necessary for you to coat certain sides of the cubes and let the finishing material dry before you coat the remaining sides. This could be done by laying several of the cubes tightly together and spraying the flat surface thus formed. After the finishing material has dried on this surface, the cubes could be turned one fourth over and that side coated, and so on until the six sides are coated. —C.F.M.

The Blue Knight's Column

There is no time quite like the early days of a new year for reviewing the past twelve months.

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There's our 1510 Flexible Lacquer that enables a user to stamp and draw a sheet lacquered in the flat . . . no chipping, peeling. It gives perfect adhesion and permanent flexibility on brass, aluminum, and nickel silver.

. . . and the line of Enamels for decorating glass and glassware has worked out well . . . and so has the material for high-lustre buffing.

. . . and the Lacquers we developed for finishing Textiles, Rubber Balls, Cash Registers, cold roll Steel Products . . . and the toilet seat white that does not turn color . . .

. . . our laboratory certainly earned its board and lodging during 1928!

* * * * *

1929 . . . another new year slides into focus . . . may it be a pleasant and prosperous one for all of you who read these words.

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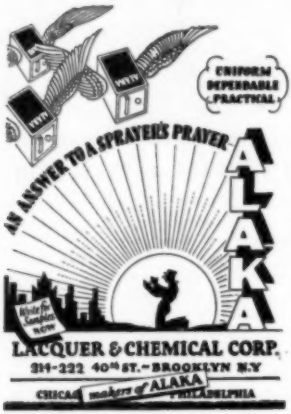

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Reclaiming Waste Materials

One thing I would like to comment on is an article by Mr. Kathju in November issue (page 72) stating that the Ford Motor Co., reclaims its spray booth waste by means of a "liquid medium" which, when mixed with nitrocellulose lacquers, gives them hardness. This must be a wonderful "liquid medium" to do that. Such a practice is not only impractical but one from which the Ford Motor Co., will, in the long run, derive more harm than good—for even a motor or chassis lacquer must serve its intended purpose and be fairly uniform to permit of easy and economical application.

My idea for any large user of lacquer would be to install free-circulating scrubbing traps in the lacquer exhaust flues and obtain costly solvents which can easily be reworked at a profit and give uniform and dirt-free products.—P. A. Patterson.

Colored Lacquers and Colored Enamels

In November Issue on page 26, there is a brief article under the caption "Colored Lacquers and Colored Enamels" and an explanation as to what is meant by each of these terms as given by Mr. G. O. Zeller.

The explanation given would be perfectly satisfactory if these terms were limited to products made on a lacquer base, but unfortunately the terminology in our industry is a somewhat confused one, and these very terms are used for entirely different products by others.

In describing the products which our company makes, we use the

word "Colored Enamel" to describe the product which is composed of pigment ground in varnish and could be called "Varnish Enamel," while the term "Colored Lacquer" is one which we use to describe a similar enamel in which the pigment is ground in lacquer. This type of definition, you see, conflicts with the one described.

If solid covering is not present in the product, we endeavor to refer to it as a "Transparent Color Varnish" or "Transparent Lacquer;" this helps to keep the two types of material distinct and clearly defined.

We feel that our use of these terms would lead to less confusion than those described by Mr. Zeller, and that great care should be taken in this matter of definition so that the present confusion is not increased but rather reduced.—Hilo Varnish Corporation.

Orange Peel in Lacquer Finishes

This is in reference to Mr. J. C. Alsee's direct questioning on page 81, last paragraph (December issue of INDUSTRIAL FINISHING). I wish to make the following observations:

In the development of new lacquer products, we advise our sales and service representatives in terms of our competitor's reducer.

We have, among other reducers, three representative thinners, the properties of which are so well known to our men that they can immediately draw inferences. These three thinners repesent (1) the worst possible to manufacture, (2) the one we recommend, and (3) the one universally adaptable. These inferences are positive

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buoys for our men's guidance, not only for sprayability and drying, but also for their resistance to blushing, degree of luster, coefficient of dilution, and last but not the least, *Orange Peel*.

Our men know exactly what they are up against in selling thinners and, when some unscrupulous competition is to be met beyond their pale of understanding, they refer matters to laboratories for their guidance. This is all so simple that I hesitate to use space explaining it in the columns of this illustrious magazine. However, I do so because I feel there are many interested readers who have followed this discussion, and they need to come to some sound conclusion instead of being left in the abysmal depth of obscurity. Consequently, I refuse an answer to the absurd question which appears at the top of page 82: "Would you recommend a motor car reducer for use with water-dip lacquer, belt cement, colored dipping lacquer or clear wood lacquer?"

This discussion started because, on reading Mr. Alsee's article in the August issue, (page 39). I felt it was bound to create misunderstanding. This, Mr. Alsee admits himself, when on page 81 (Dec. issue) he writes, ". . . and as Mr. Kathju has tried to pick apart the article through his own *wrong impression*, I will say that the object of *the article was in view of the same condition that Mr. Kathju has tried to describe* differently from writer."

Mr. Alsee, thanks for your offer of sending me laboratory reports and sample of a certain brand of reducer. I am not interested in it. I want the finishing foreman, the purchasing agent and others interested in this discussion, to know that with a certain brand of lacquers it is not necessary to use the

same brand of thinners; that any *good* grade of thinner can be used with any grade of *lacquer—good or bad*—without giving any more orange peel than you would get if you used lacquer and thinner of the same brand. In this, Mr. Alsee, Mr. J. K. Cooper (November 1928, page 74) and I agree. If there is yet a misunderstanding, I would gladly attempt to dispel same on hearing from any reader of INDUSTRIAL FINISHING.—Kam N. Kathju.

Dip Finishing by the Squeegee Method

In this article I will endeavor to explain how the best results are obtained in the dipping of broom and mop handles by the rubber-gasket or squeegee method. In a later article I will explain just how the modern metallic and spatter metallic effects are produced by this same method.

Broom handles were first finished by dipping them in a clear shellac solution to which, if colors were desired, a small amount of dye solution was added. Later, the solid-covering enamels came into vogue and all of these finishes were obtained by merely dipping the handles in an open tank of the finishing material, and hanging them up in the air to dry.

The squeegee method represents an improvement over open dipping. By this method the film is left smooth and even for the entire length of the handle, with practically no loss of material through evaporation or excess on the handle. There are many types of these squeegee tanks now in use, but one of the most practical and easiest to construct is shown in the accompanying drawing.

The apparatus consists of a long cylindrical tank which is closed at the bottom. This tank should be about 4-in. in diameter and at

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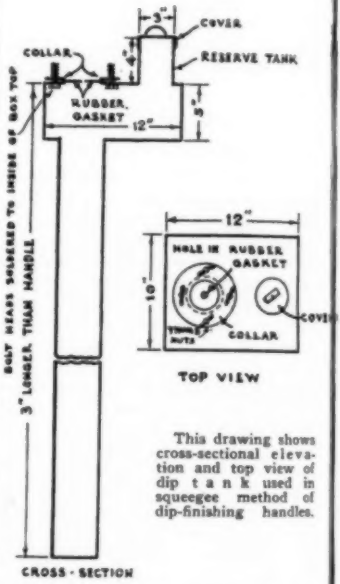
least 3-in. longer than the handles to be dipped; and block tin is to be recommended, although galvanized iron tanks are in constant use.

The open end or top of this cylindrical tank should be soldered over an opening cut in the bottom



This drawing shows cross-sectional elevation and top view of dip tank used in squeegee method of dip-finishing handles.

of a box of the same material. A suitable size box to use is 5-in. high, 10-in. wide and 12-in. long.

Directly over the hole where the cylindrical tank is soldered to the box, another hole about 3-in. in diameter should be cut in the top of the box. This opening should be quartered ½-in. back from its circumference and four thumb bolts should be soldered up through the top of the box, so that the threaded ends are up. Between these bolts and over the opening, the rubber gasket is laid

and bolted down by means of a metal collar which will fit over the edge of the gasket. The collar is clamped down with thumb nuts.

On top of the other end of the box a 3-in. cylinder about 4-in. high is soldered over another opening. This is where the lacquer or lacquer enamel is run in, and a constant level maintained. This cylinder should be capped with a close fitting cover to prevent loss of lacquer through evaporation.

The rubber gaskets used should have a hole, perfectly round, about ½ the diameter of the handles to be dipped. The gaskets come in various degrees of hardness, the more flexible ones leaving a heavier coating.

The amount of material left on the handle may also be regulated, to a large extent, by the type of lacquer used. One gasket will usually dip from 150 to 400 handles.

The dipping operation is simple and production per man is comparatively high. All that is now necessary is to fill the dipping tank to within ½-in. below the rubber gasket. The handle to be dipped is forced through the hole in the gasket to its full length. This forces the overflow of lacquer into the reserve cylindrical tank at the other end of the box.

The handle should then be withdrawn with a uniform rapid motion, being held vertically, of course, so the coating on all sides of the handle will be uniform. The gasket strips off the excess lacquer into the cylindrical dip tank.

Coats can be applied at the rate of approximately two per hour, this being somewhat dependent upon the thickness of the coat and the type of lacquer or lacquer enamel used. The number of coats necessary will depend upon the

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finish desired. If a natural finish is wanted, all that is required is to dip them in a clear lacquer, or a richer tone can be obtained by adding a small amount of a dye solution to the clear lacquer.

Should an opaque or solid covering finish be desired, then lacquer enamels should be employed. It will be found that some of these cover much better than others, so that in a few cases it may be necessary to add an extra coat. In some instances a finishing coat of clear lacquer is applied to increase the gloss.

I might add, in closing, that the dipping of these handles will be much easier on the operator if the cylindrical dip tank is put down through a hole in the floor, so the reserve box will remain on the floor level.—L. B. Miller.

To Prevent Varnish Checking

In these days of research and mutual interchange of ideas, when men dote on "knowing their stuff," it is by no means strange that great improvements have been and are being made relative to the proper methods of wood finishing. One of the things over which we have studied and argued and thought of at length, is why varnish will check or crack, apparently of no cause; it is with the thought in mind of bringing one or two things to light with regard to checking, that this article is written.

That there are many causes for the trouble cannot be denied. One thing is the moisture content of the wood itself. If it contains any free moisture, it will shrink in time to an extent which exceeds the elasticity of the finish, and buckling and fracture will surely follow. Another thing to be considered is the fact that if free

moisture is present, it will keep the bottom coat of finish in a more or less tacky condition, thereby robbing the final coats of the firm foundation they should have. If it were possible to reduce wood to a bone dry condition, and keep it that way, I am sure that much of our checking trouble would disappear.

Especially is this troublesome where end grain is revealed, for end grain absorbs and releases moisture very rapidly. Finishers know that if end wood is given the same treatment as flat grain or edge grain, it will show up darker, due to the fact that it absorbs more of the finish. The logical remedy for this would be to take extra care on the end grain as to filling, using some light colored filler.

The thinner a coat of finish can be applied with uniformity, the less chance there is of it checking. The varnish finish starts drying on the outside where it is exposed to the air. The drier the top of the coat becomes, the less it lends itself to the transfusion of what moisture remains underneath, therefore the thicker the coat, the more difficult for it to dry uniformly.

I would not be surprised if at some future time we shall resort to some artificial means of keeping the top of the coat uniform with the bottom, with regard to its degree of hardness, throughout the drying process. If the moisture cannot escape into the air, much of it will be absorbed by the wood itself, and there may be a slight swelling of the wood; the tacky underside of the varnish coat will follow the action of the wood, while the outside of the coat remains fixed. There you have a stress set up in the varnish, which can only find

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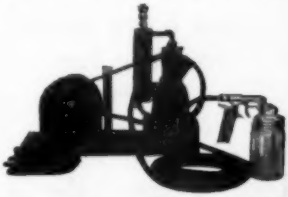

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relief through checking, and check it will.

Often this checking will not be noticeable at the time it occurs, but it is present just the same. Then, if the article dries, or is stored in a heated room, these checks will afford an avenue of escape for the moisture which has caused the trouble. As the moisture escapes, these checks, the underside of the finish and the surface of the wood contract slightly. From this point on, the trouble works like compound interest. The wider the checks open, the greater the chance for moisture to escape. The more the moisture escapes, the wider the checks open. Not until things are uniformly dry does the process cease, and by that time the finish is a wreck.

Other things contribute their bit toward checking, but I believe the foregoing to be a major cause. If we can determine the actual causes for these things, it is the first step in effecting a real remedy.—J. E. Hyler.

Shellac Manufacturers' Code of Ethics

The American Bleached Shellac Manufacturers' Association, Inc., has formulated and adopted a Code of Ethics for the industry represented by it and in which its members are engaged. The code is printed in a 10-page pamphlet, copies of which will be sent to those interested.

Members of this association who signed in agreement and endorsement of the code are:

Berry Brothers, (Inc.); Bradshaw Praeger & Co.; James W. Brynes Shellac Co., Inc.; Dings & Schuster, Inc.; M. Feigel & Bro., Inc.; Kasebier-Chatfield Shellac Co.; Mac-Lac Co.; The Montrose Corp.; The Marx & Rawolle Corp. Rodgers Pyatt Shellac Co., and William Zinsser & Co.

Associate members who are in accordance with the movement are:

Barrett Varnish Co.; The Clinton Co.; James B. Day & Co.; C. E. Franche & Co.; A. R. Haeuser Co.; E. T. Stille & Co. and H. B. Young & Co.

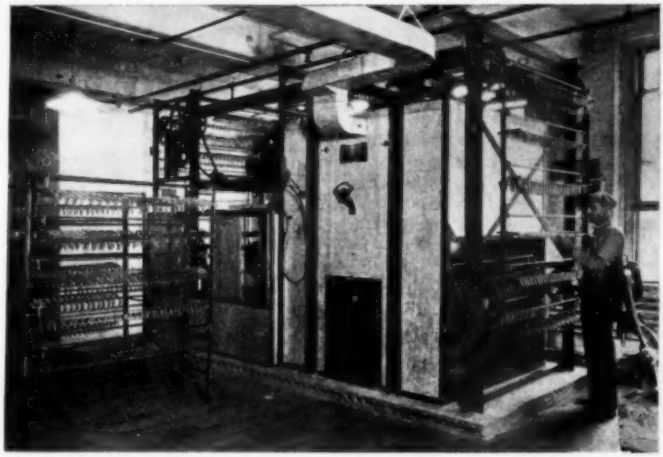


Fig. 2—The other end of the oven and conveyor equipment. The foreman is examining finished pieces taken from the conveyor.

AN AUTOMATIC LACQUERING CONVEYOR

Excerpts from an article in "Industrial Gas" wherein interesting automatic lacquering and lacquer-drying operations and equipment are described

By B. W. Gelb, M. E.

HAVING an appreciative understanding of the value of modern methods of manufacture, an officer of the Artistic Wire Forming Co., of New York, one of the largest concerns of its kind in this country, endeavored to increase his over-all plant efficiency by first, introducing automatic conveyor equipment and second, by using hot air—sometimes called "warm" air—in preference to steam for a certain drying process. He called upon experts for assistance and advice in the solution of his problem, with the result that a machine was designed which automatically lacquers and then dries the metal pocketbook frames.

The straight flat wire for use in making frames, is shipped from the mills on reels. The wire used in this particular plant is of one thickness only, the gauge being .025-in. The width of the wire is one of three sizes—$\frac{1}{2}$, $\frac{5}{8}$ or $\frac{3}{4}$-in.—depending upon the requirements of the sales department.

From the very first and practically to the last forming operation, all the work is completed with dies held in place by power presses. In the first or primary series of operations, the wire is cut, bent and shaped by various and specially-designed presses

to the forms desired of the finished product. Immediately following comes a second set of operations termed the intermediate operation. In these, the frames are given plating baths and, using the terminology of the trade, they are "cut" which is in reality a buffing operation. The frames are plated in various chemicals, "cut" again and washed and dried.

Lacquer Dipped

Since the finish on the final product depends to a great extent upon the accuracy of the timing of the lacquer bath, it is imperative that there must be no mistake on the part of the workmen.

The problem presented, therefore, was of a dual nature. First, and of utmost importance, a machine had to be designed which would insure a perfectly and uniformly-dipped article; second, and of equal importance, a quickly and thoroughly dried frame had to be obtained. Such a machine, as shown in Figs. 1 and 2, was designed by the engineers of a well known heat oven company. Not only has this machine eliminated all former difficulties encountered with the old process but it has, within practically three months of operation, paid for itself.

Conveyor and Oven

The racks holding the frames are hung, as shown in both Figs. 1 and 2, on the "flights" of the conveyor chain. Referring to the front view of Fig. 1, the chain moves downward. The flights continue carrying the racks, in horizontal position, into a trough filled with a very fine grade of lacquer. As the racks emerge from the tank, the excess lacquer drips off the frames.

It should be noted here that since the frames are always in the same upright position as when they are dipped, no lacquer remains in the channel or tubular part of the frame. Formerly, this was a source of considerable trouble, inasmuch as lacquer remained in that part of the frame and would have to be removed by hand after the baking process was finished.

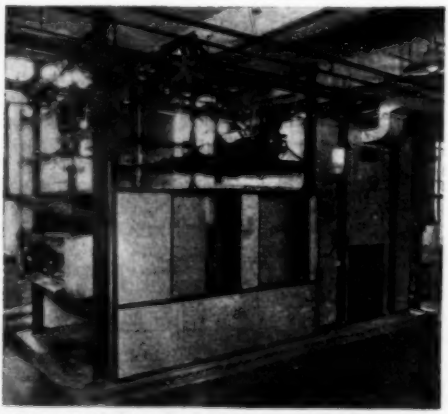
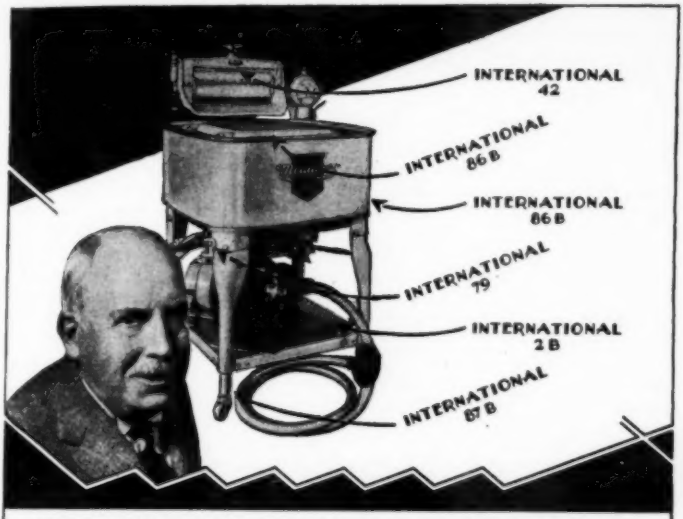


Fig. 1—Front view of indirectly heated oven through which the conveyor carries lacquer-dipped parts formed of wire. The strand of chain at left moves downward.

After all the excess lacquer has dripped off, the frames enter the heating or baking chamber. Warm air, from a gas-fired warm air heater, is forced into this chamber. The air contains and supplies sufficient heat to dry or "bake" the lacquer. The temperature of this chamber may be varied with ease but it is usually maintained between 125



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and 150-deg. F., depending solely on the speed of the conveyor chain. The lacquer vapors from the heating chamber are removed by a suitable large-size flue.

When the frames emerge from the heating chamber they are completely finished, this operation being the final step in their manufacture. In the fore-ground of Fig. 2, the foreman is shown examining the frames as they come from the chamber. The finished frames may be removed and the unfinished frames started either at this point or at the other end of the machine. The entire operation of dipping and baking is now completed in a maximum time of 15 minutes.

Advantages of Present Method

Now, since it takes only a few minutes for the air to reach the proper temperature, one rack may be run on the machine and tested. If the correct finish is not obtained the first time, the elements that control the final outcome may be changed to suit the requirements of the operator.

Since all the excess lacquer at present drips into the lacquer trough before the frames are carried into the baking chamber, practically no lacquer is wasted. The lacquer bill is being cut to one-half of what it formerly was. Under the old system a workman, whom the industry called an experienced "lacquerer," had to be employed and had to be paid a fairly high wage. It was he who prepared the lacquer and did all the necessary dipping of the frames. His inconsistency was the cause of at least one-half of all the trouble.

Now, a young girl receives the frames from the plating and drying department, places them on racks, gives these racks to the machine operator and the result—an excellently-finished product and a drastic cut in labor costs. Figures obtained from the company show that a saving of 75 percent in labor costs over the previous method has been effected by the use of the new machine. Such a radical saving was, for itself, worth the moderate installation cost.

A third and indeed a very important saving was that made by the elimination of poorly lacquered frames. No longer are some $20,000 wasted each year in stripping, re-plating and relacquering due to the inaccuracy of the "experienced" lacquerer. As it is now, the machine finishes an average of 100-gross per day of eight full hours of operation, and it is a fact that if increased sales should require a greater production, the machine is capable of finishing a maximum of double the output obtained at present.

Unit heaters offer more to the finishing department than to most any other department around the plant. Correct temperature and the ability to change or maintain the desired humidity and temperature conditions keep the efficiency of the department uniform, and unit heaters, correctly placed, seem to be a most logical answer.

George Belcher Writes:

I have a modern well-equipped Industrial Finishing Shop, including a sandblaster for cleaning metal products.

I would like to hear from any manufacturer of metal products interested in having his lacquer-finishing work handled by experts.

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The modern, efficient Nichols drying equipment not only reduces drying time to a fraction of that required by former methods, but greatly improves the quality of the finish. Its engineering and mechanical improvements represent a tremendous advance in methods and insure substantial reductions in production and labor costs.

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LACQUER DRYING
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Pipe Fittings, Black Enameled

Describing the trucking, handling, tumbled dry-cleaning, wet-cleaning, dip-finishing, draining, baking, conveying, machining, washing and inspecting of pipe fittings that are black-enamel finished

By E. Perry

AS A REGULAR thing, pipe fittings such as ells, tees, crosses, etc. are supplied in cast iron or steel, usually plain, unfinished and in malleable iron, plain or galvanized; and, excepting the large fittings for underground mains which are coated with either tar or asphaltum compounds, it is not customary for these fitting to be finished with varnish products. However, an eastern foundry, on a special line of malleables, supplies a very large proportion of its output in baked enameled finish.

The fittings are trucked from the casting room to large steel tumblers into which they are placed with a charge of "stars"—those spiked things the children call "jacks"—wherein they are cleaned and smothed free of burrs and sand before going to the finishing room.

Cleaning and Dipping

At the farther side of the finishing room are two large tanks, fitted with steam coils. One contains a hot mildly-caustic solution into which the castings are hung individually on S-hooks for probably five minutes, or during the time of stringing these until all the cross bars are filled; then they are removed in the same order and transferred to the second tank, which is filled with clean water for rinsing, and again similarly removed to bars on rack trucks.

Both solutions being very hot, the castings begin to evaporate the water soon after being withdrawn, but even so, some are more or less wet when they are next immediately dipped into the tank of special black enamel.

After being dipped they are suspended over the dipping tank until practically drained; then hung on oven trucks for 30 minutes and run into gas-fired ovens at 300-deg. F., where they are held at that temperature for half an hour.

The routine of operations is gauged for continuity without loss of time, that is, the ovens are recharged with waiting trucks as fast as the completed charges are withdrawn. There is always one set of racks ahead cooling; this allows the baked fittings time to cool off somewhat before they are taken down and thrown into steel cans for delivery to the machining room.

Machining; Cleaning

It is usually the following day—say about 24 hours elapse—before they are set up in the machines for tapping, because in this work the parts are subjected to oil and also thread-cutting compound.

(Continued on page 108)

Every heat unit (B.T.U.) does its full duty in a Swartwout Metal Insulated Oven

Send for complete description and data sheets showing construction and efficiency of the Swartwout Stop Gap Joint .... a most remarkable improvement in oven construction. The Swartwout Company, 18511 Euclid Avenue, Cleveland, Ohio.

Swartwout Metal Insulated Ovens

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Economical Finish Drying

There are many finishes that require high temperature drying equipment. The heaters that provide the hot air should always be considered with three things in mind, namely; the characteristics of the finish, the cheapest fuel and the maintenance costs.

A highly specialized heater has been placed on the market by Drying Systems, Inc., Chicago, manufacturers of various types of drying equipment. This heater has been designed to overcome the objections that heretofore have seemed inherent to the thin metal type of heater. It is a unit heater, indirect fired by gas or oil, in which high heat transfer is accomplished by exceptionally efficient heating surfaces. The burning out of heating surfaces has always been a source of trouble to manufacturers. This new heater eliminates the problem because the tube surface nearest the flame is protected from direct flame impingement by the employment of protecting shoes (an exclusive feature of the Allosteel Multitube Heater). It is almost impossible for the tubes to burn out.

The Allosteel Multitube Heater will furnish heated air at any of the temperatures required for the various enameling and japanning processes. It will deliver the air at the required temperature and in the desired quantity.

Many of the motor plants are experiencing wonderful results by using this new heater for the drying of their prime and finish enamel coats. Further information on this heater and other drying equipment can be obtained by addressing Drying Systems, Inc., 1800 Foster Avenue, Chicago, Illinois. *(Advertisement)*

Pipe Fittings Black Enameled

(Continued from page 106)

Thence they travel on a conveyor, during which time the machining is inspected. Before the fittings reach the end of the conveyor, they are discharged into a revolving horizontal drum containing hot cleansing compound to saponify the grease. Finally they emerge from a tumbler at the end of the line, wherein the fittings are rinsed off by jets of hot water and steam. Passage through these washers is at fairly good speed, so the enamel is not unduly affected.

The parts drop off onto another conveyor and here get their final inspection, especially for cracks and other defects which are easily detected by sound—by tapping the fittings on a solid steel plate Discards are returned to the foundry, but the others are tossed into their respective canisters, being assorted according to style and size—just as mail clerks distribute mail to the various sacks for different destinations.

Finish Inspection

It will be evident to the reader that the enamel undergoes very severe conditions, and still the resultant coating retains a glossy tough film that is intact except here and there where it has been actually worn off in the revolving washer. Any fittings that show too much abrasion of the finish are touched up before being put into stock bins with a special, quick-drying black, brushed on the bare spots.

It should be stated, however, that considerable difficulty was encountered in this process before finally obtaining the character of enamel most resistant to the severe service it has to with-

stand. Because of these difficulties, a plan was under consideration whereby the articles would not be finished until after the machining operations, but that also has its serious drawback because the threads would become filled with enamel and this caused trouble in assembling on the job. Therefore, it was practically compulsory to develop the special coating which has since been satisfactorily used.

Automotive Bake-Finishing

A typical baked finishing schedule for an automobile refinishing shop might be outlined as follows:

One coat of primer sprayed on and then baked four hours at 200-deg. F.; then the surface should be immediately spot puttied or knife glazed. This can be done while the surfaces are still hot from the oven. Sanding may be commenced on the light or thin places after about one hour, leaving the heavier glazed places till the last. Next, the two or three coats of filler are sprayed on half an hour apart and then baked at a temperature of 180-deg. F., for a period of three to four hours.

Sand wet in the usual way and

(Continued on page 112)

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Made in a modern plant devoted to the manufacture of Industrial Finishes only.
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EDITORIAL

1929—The Outlook; The Trend; The Warning

In the business world highly favorable conditions surround the approach of 1929, but this does not mean that enterprise in 1929 will enjoy a respite from the problems of distribution and production which are more and more strongly pressing for solution. In the field of trade the inexorable progress of large-scale merchandising as exemplified in the chains and other great unified organizations, will in 1929 compel with new force the attention of manufacturers, as well as wholesale and retail distributors.

So revolutionary a change in the distributive mechanism of a nation's goods, as is now in full progress, involves painful as well as painstaking readjustments.

In manufacture, the great problem is to attain and hold a nice ratio of output to the fluctuating volume of demand. In more and more lines of enterprise the attempt is being made to secure this adjustment by volitional control of output rather than by the blind forces of competitive struggle. Desirable as such a method is, the long record of past failure must warn against a too-easy hope of its success.

Danger comes from business that is too good rather than too poor—from the active demand, rising prices and high profits that tempt an overjudgment of the market, leading to increased output and enlarged capacity that in the end mean its undoing. It is in this fact that the most serious threat to next year's ultimate prosperity lies. The year may start so well as to cause an overestimate of its possibilities.—*National Bank of Commerce in New York.*

Lacquer Thinners and Orange Peel Effects

Quite a lively and interesting discussion has been going on in these pages since the publication in August issue (page 39) of J. C. Alsee's article entitled, "Orange Peel in Lacquer Finishes." Really, the main point at issue appears to be whether the user of nitrocellulose lacquers can safely use universal thinners purchased wherever he chooses or whether, to be sure of satisfactory results, he must purchase thinners from the concern that supplies him with lacquer. Some very well informed men are on one side of this question, while others are on the other side. "When doctors disagree, who shall decide."

For every specific occasion wherein the user is in doubt as to

A few good reasons why Armitage Armorlac

R epresents the *Ideal* industrial lacquer:-

M ade in a large variety of beautiful colors

O ptional for use on composition, wood, reed, or metal

R etains its original luster indefinitely

L acks nothing . . . non-porous, adhesive, elastic

A pplies easily; dries quickly

C overs *More* surface per gallon!

John L. Armitage & Co.
Newark, N. J.
Makers of Varnishes and Lacquers

whether a certain lacquer and thinner are going to make a satisfactory combination, he has at least two ways to find out. One is to submit them to a reputable lacquer chemist and take his word for it; the other is to order tests made either in a laboratory or at the factory. Tests properly made and supervised will nearly always reveal what specific information is desired concerning the particular materials under examination.

Advertise the Finish

In preparing advertisements for various types of merchandise, particularly specialties, the advertising manager examines the product in order to discover something worthy of talking about to the prospective buyers and something that will have selling appeal. There are many such features of nearly every specialty, and among them we find of growing importance—the surface.

Pick up any of the leading magazines and you will see that in a large percentage of specialty advertisements, finish or surface is either stressed in the copy or it is made the prime feature of the illustration.

Experienced advertising men recognize the great selling appeal of a thing that looks good because of its exterior finish and from motor cars to sewing machines, the surfacing of the main parts is an outstanding attraction by which the prospective buyer is lured to purchase.

The growing importance of this finish proposition in many lines of advertising is apparent on every hand; retouchers are striving to reproduce the finishes of furniture and other articles as well as the original finisher of the actual product has done; photographers are being required to get the true glossy effect on advertising pictures of articles which sell to a great extent upon appearance.

Manufacturers and jobbers using the general magazines have an opportunity to get very excellent results through the employment of high-grade photography and through the proper retouching of pictures after they are taken.

It becomes necessary in preparing pictures of furniture and specialties to exaggerate, to some extent, the glossy surface which so strongly appeals to the buyer. This exaggeration is perfectly fair inasmuch as the unretouched photograph would fail to do the real surface justice.

Automotive Bake-Finishing

(Continued from page 109)

wipe off all water with a chamois; be sure to allow sufficient time for complete evaporation of the moisture. Apply a coat of enamel and bake for 2½ to 3 hours at 180-deg. F. Dry sand the surface lightly with very fine—about 8/0—flint paper and carefully wipe off all dust before second-coating with the enamel, which will be oven-dried same as the first coat.

Rub down with compound, and polish if finishing varnish is not going to be used. If the job is to be varnished, any decorative work such as the application of metallic leaf or striping and lettering, etc., should be done first. —Thomas.

A speaker recently estimated that the failure to use paint costs Americans many millions a year in depreciation. The failure to use the most attractive finish and the one best suited to modern merchandising, costs manufacturers another large sum.